AIRBORNE EQUIPMENT OF SATELLITE NAVIGATION

USER`S MANUAL

OPERATOR'S GUIDE

PART 2 ТДЦК.461513.077-02 РЭ1

RECORD OF REVISIONS

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ABBREVIATION LIST

ACP	- aircraft current position;
AP	- aircraft position;
ATC	- air traffic control;
AC	- aircraft;
BFO	- booster frequency oscillation;
CP	- central processing;
DME	- distance measurement equipment;
DT	- desired track;
GLON	- Global Navigation;
AE	- airborne equipment;
GLONASS	- Global Navigation Satellite System;
GNSS	- GPS+GLONASS joint system
GPS	- US global positioning system;
HSI	- horizontal situation indicator;
LLT	- linear lead of turn;
NDB	- navigation database;
NP	- navigation point;
NSV	- navigational space vehicle;
NT	- navigation task;
on/off	- switch on/off;
OTC	- one-time command;
PCU	- peripheral control unit;
RAM	- random access memory;
RICU	- operation and acceptance indicator unit;
RS	- radar station;
RW	- runway;
SBAS	- Satellite Based Augmentation System;
SNS	- satellite navigation system;
SV	- space vehicle;
SW	- software;
TP	- target point.
UM	- user's manual;
USW	- ultrashort waves;
VHF	- very-high frequency;
WP	- waypoint;

Special symbols displayed on RICU

Measuring unit

$^{k}_{t}$ - junctions;

$^{k}_{m}$ - kilometres;

m - metres;

$^{n}_{m}$ - miles;

$^{f}_{t}$ - feet;

$^{k}_{h}$ - kilometres per hour;

«°» - degrees;

$^{m}_{Hz}$ - megahertz;

$^{k}_{Hz}$ - kilohertz.

Special symbols used

$^{\circ}_{M}$ – degrees with magnetic declination;

$^{\circ}_{T}$ - true degrees without magnetic declination;

N - northern latitude;

S - southern latitude;

E - eastern longitude;

W - western longitude;

a - NT category airport (**APT**);

v - NT category omnidirectional USW-beacons (**VOR**);

n - NT category nondirectional radio beacon (**NDB**);

i - NT category flight plans intersection (**Intersection**);

u - NT category user waypoints (**User WP**);

«_» - symbol, filling parameter display, if:

- parameter to be computed in process of navigation task solving, but solution is absent,
- search of NP to be accomplished by identifier or name for indication of identifier decades, name and region.

Glossary

Activate Flight Plan?	- flight plan activation;
Activate Leg?	- leg activation;
Activate?	- flight plan activation;
Autozoom	- switching on automatic zoom of graphic flight plan image;
Change Fields?	- change field selection;
Closest Point of FPL?	- creation of WP on DT at minimum distance from WP chosen;
Copy Flight Plan?	- copy of flight plan to memory;
Create New Flight Plan?	- creation of a new flight plan;
Delete All Flight Plan?	- deletion of all flight plans;
Delete All User Waypoint?	- deletion of all NP of **User WP** category;
Delete Flight Plan?	- deletion of a flight plan;
Delete Navaid	- navaid deletion;
Delete User Waypoint?	- deletion of user WP (**User WP**);
DTK	- flight plan orientation by course angle;
Graphics View SATs	- graphic display of satellites position;
Invert Flight Plan?	- flight plan inversion;
Reference WP	- selection of original coordinates from NDB;
Remove Approach?	- removal of procedure **Approach** from flight plan;
Remove Arrival?	- removal of procedure **STAR** from flight plan;
Remove Departure?	- removal of procedure **SID** from flight plan;
Restore Defaults?	- setup of interchangeable fields according to factory default;
Retarget To Point?	- retarget to WP;
SCALE	- activation of scale mode;
Select Approach?	- selection and insertion of procedure **Approach** to flight plan;
Select Arrival?	- selection and insertion of procedure **STAR** to flight plan;
Select Departure?	- selection and insertion of procedure **SID** to flight plan;
Select Navaid	- navaid selection;
Sort List By Number? / Sort List By Comment?	- flight plan sorting by numbers or by alphabet;
Set Info for Navaid	- beacon selection the distance to which should be displayed in DME indicator;

Text View SATs	- text view of satellites position;
True North	- setting of flight orientation to north;
View Route	- route view;
View User Waypoint List?	- user waypoints list view.

Parameters displayed on interchangeable fields

Along Track Distance (ATD)	- distance to TP on DT (Sост);
Altitude (ALT)	- altitude;
Bearing (BRG)	- bearing to target point;
Cross Track Err (XTK)	- deviation from desired track;
Cumltv Dist (CUM)	- total distance to flight destination point on desired track;
Desired Track (DTK)	- desired track angle;
Distance (DIS)	- distance to target point;
Empty	- empty line;
Enrte Safe Alt (ESA)	- safe flight altitude on flight plan;
Est Time Arvl (ETA)	- arrival time to WP;
Est Time Enrte (ETE)	- flight time remained to WP;
Ground Speed (GS)	- ground speed;
Horiz DOP (HDOP)	- horizontal geometric factor;
Horiz Integr Limit (HIL)	- horizontal integrity limit;
How Vis GLN Sats (VGLN)	- number of visible satellites GLONASS;
How Vis GNSS Sats (VGNS)	- number of visible satellites GPS+ GLONASS;
How Vis GPS Sats(VGPS)	- number of visible satellites GPS:
How Work GLN Sats(WGLN)	- number of operating satellites GLONASS;
How Work GNSS Sats (WGNS)	- number of operating satellites GPS+ GLONASS;
How Work GPS Sats (WGPS)	- number of operating satellites GPS;
Leg Distance (DIS)	- leg distance on DT;
Precision (RMS)	- standard coordinates deviation;
RAIM Available (RAIM)	- off-line test of GNSS signals integrity;
Track (TRK)	- actual course angle;

Track And Err (TKE)	- additional turn angle (difference between desired track angle and current track angle);
Vert DOP (VDOP)	- vertical geometric factor;
Vert Integr Limit (VIL)	- vertical integrity limit;
Vert Precision (RMSH)	- standard altitude deviation.

AIRBORNE EQUIPMENT OF SATELLITE NAVIGATION – APPENDIX J

(mandatory)

Operator guide

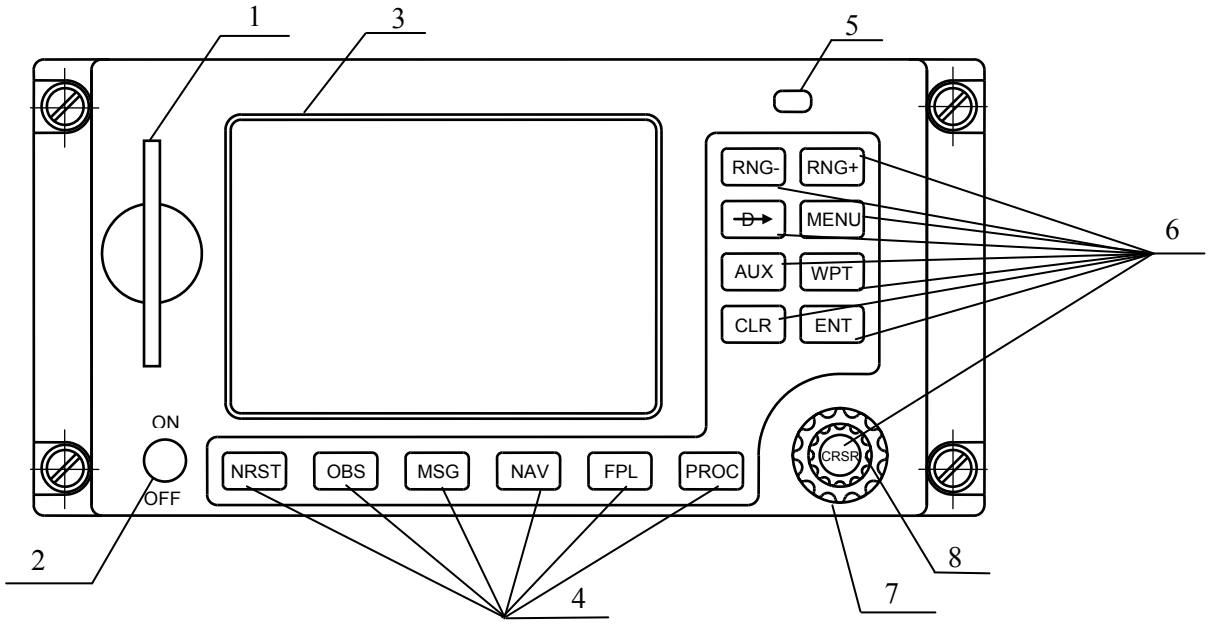
Part 2 of user's manual ТДЦК.461513.077-02 РЭ1 for satellite navigation airborne equipment ТДЦК.461513.077-02, code CH-4312-02 (hereinafter referred to as equipment), defines work order with equipment and is intended for the aircraft crew members.

Only persons who studied user's manual ТДЦК.461513.077-02 РЭ, ТДЦК.461513.077-02 РЭ1 and equipment operating rules are admitted to operate the equipment.

J.1 General information

Control elements

External view of front panel and equipment controls layout are shown in figure J.1.1.



1 Navigation database storage removable unit
2 On/Off button
3 Display
4, 6 Control buttons
5 Photo resistor, adjusting display brightness
7 External rotary knob of handle
8 Internal rotary knob of handle. When pressing internal knob end, the function **CRSR** is being accomplished

Figure J.1.1

RICU **ON/OFF** button

ON/OFF button identification:

- **ON/OFF** – for RICU before serial № 03908020 inclusive;

- ⏻ - for RICU since serial № 03910021.

***Note* – Hereinafter in the text ON/OFF button is indicated for RICU turning on/off. All ON/OFF button operations refer also to ⏻ button.**

***NRST** Button*

Button **NRST** is intended for transition to nearest WP form from database.

Repeated pressing of the button **NRST** returns the form which was before activation of the form **NRST**.

***OBS** Button*

OBS Button is used for setting flight in **OBS** mode (outlet to WP with desired transit angle).

When accomplishing flight in **OBS** mode, signal highlight of the button OBS is being switched on. After flight cancellation in **OBS** mode, background highlight of the button is being switched on.

By pressing **OBS** button, with indication in status line **SUSP**, interruption of automatic changeover to next leg of flight plan and transition to:

- repeated flight of waiting area, for procedure **STAR**;
- approach to second circle, for procedure **APPROACH**

are being accomplished.

Note – ***SUSP*** *– request for interruption of automatic changeover to next leg of flight plan when executing procedures* ***STAR*** *or* ***APPROACH***.

***MSG** Button*

MSG Button is intended for display output of system messages and messages about mating equipment operation.

When a message is output, signal highlight of the **MSG** button is turned on. If several messages, signal highlight of the **MSG** button will blink, until the last message is read. After all messages are read, background highlight of the **MSG** button is switched on.

***NAV** Button*

NAV is Button intended for transition to navigation form.

This form is main one for equipment, therefore repeated pressing of the **NAV** button does not lead to any actions.

***FPL** Button*

FPL Button is intended for transition to flight plans form.

Repeated pressing of the **FPL** button returns the form, which was before activation of the form **FPJ.**

***PROC** Button*

PROC Button is intended for transition to form of selection and loading of standard takeoff, landing and approach procedures.

Repeated pressing of the **PROC** button returns the form, which was displayed before activation of the form **PROC**.

*Buttons **RNG-** and **RNG+***

Buttons **RNG-** and **RNG+** are used for displayed graphic information zooming.

D► *Button*

Button **D►** is used to ensure flight in **DIRECT TO** mode to selected target point.

***AUX** Button*

AUX Button is intended for transition to form **AUX**.

Repeated pressing of the **AUX** button returns the form, which was before activation of the form **AUX**.

***MENU** Button*

MENU Button is intended for activation of pop-up window **PAGE MENU** relating to active page or active form window.

The button is used to ensure selection of additional options of active page or to accomplish settings for this form page.

Repeated pressing of the **MENU** button closes pop-up window **PAGE MENU**.

***WP** Button*

WP Button is intended for transition to database form. Repeated pressing of the **WP** button returns the form, which existed before activation of the form **WP**.

***CLR** Button*

CLR Button is intended for refusal to edit, return from window to page of respective form, closure of pop-up window **PAGE MENU**.

***ENT** Button*

Button **ENT** is intended for confirmation of information input, confirmation of action accomplishment or for moving highlight to next editing parameter.

CRSR button

CRS Button is located on the internal knob end of handle and is used for activation/deactivation of parameter display field in window or form page, refusal to edit, return from window to page of respective form, closure of pop-up window **PAGE MENU**. Function of the **CRSR** button is accomplished by pressing the internal knob end of handle.

Background highlight of control buttons is constantly switched on.

Handle

Handle consists of two rotary knobs: external and internal.

External knob is intended for editing element selection, moving highlight on pop-up windows.

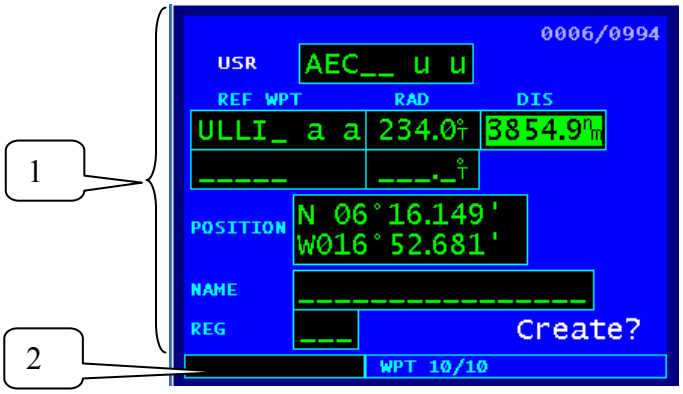
Internal knob is used for page flipping in the form and for search within editing element.

Function of the **CRSR** button is accomplished by pressing the internal knob end of handle.

Information presentation on RICU display

All navigation parameters, information and function being executed, necessary for equipment operation are joined in forms and displayed on pages and windows of the forms on RICU. Example of the page displayed is shown in the figure.

NOTE. PARAMETERS VALUES IN FORMS STATED BELOW ARE RANDOM.



1 Page or window display of the form
2 Display of status line

Figure J.1.2

Form may contain one or several pages. View of form pages is accomplished by rotating internal knob of the handle clockwise or counterclockwise with highlight of parameters or functions display fields switched off.

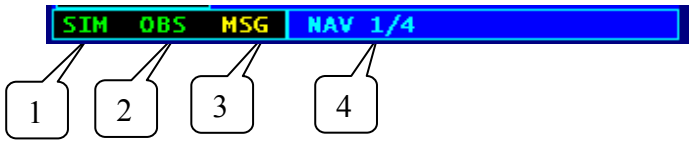
Form pages can contain one or several windows. Access to windows is stated in equipment forms description.

Status line is displayed in lower part of RICU display (figure J.1.2).

Status line

Status line is intended for operation modes and equipment status display.

External view of the status line is shown in the figure J.1.3.



1 Coordinate determination mode:
- **GPS**, **GNSS**, **GLON**, **SBAS** - according to data of GNSS sensor;
- **GNS2 -** according to data of GNSS sensor of the second RICU;
- **D/D** - according to data of aircraft distance meter (DME/DME);
- **D/D2** - according to data of aircraft distance meters (DME/DME) from the second RICU;
- **V/D** - according to data of aircraft distance meter, bearing measurer to beacon (VOR/DME);
- **V/D2** - according to data of aircraft distance meter, bearing measurer to beacon (VOR/DME);from the second RICU;
- **SVS** - according to data of course and air systems;
- **SVS2** - according to data of course and air systems from the second RICU;
- fill-in-the-blank field - «**Search**» mode;
- **SIM** - according to data of built-in simulator

Notes

1 *With no adequate coordinates and time it is impossible to switch on* ***D/D*** *u* ***V/D*** *coordinate determination modes.*

2 *To increase determination accuracy of navigation solution in* ***SVS*** *mode it is required to input wind parameters.*

2 Special manoeuvres execution display field:
- fill-in-the-blank field – no special manoeuvres;
- **SUSP** – request to cut off automatic changeover to the next flight plan leg. Changeover is fulfilled after pressing button **OBS**;
- **OBS** – outlet to WP with desired transit angle;
- **OFST** – flight execution on parallel route.

3 Messages indication field:
- fill-in-the-blank field – no messages;
- **MSG** – blinking inscription of yellow colour – there are messages

4 Information field:
- form name and active page number/number of form pages;
- window name;
- warning messages output.

Figure J.1.3

Parameter input

To input (edit) parameter:

- fix highlight in display field of parameter which value it is necessary to input (to edit);

Note – *If there is no parameter highlighted on display, press the button **CRSR**.*

- turn internal knob of the handle one position further. First symbol of parameter being input (edited) will be highlighed;
- by rotating internal knob of the handle adjust set the necessary value of the first parameter symbol;
- moving highlight, by rotating external knob of the handle, through decades of parameter display field and fixing necessary value of the symbol, by rotating internal knob of the handle, set necessary value of parameter being input (edited);
- to confirm parameter input press ENT or move highlight, by rotating external knob of the handle, clockwise beyond the range of display field of parameter being input (edited).

N O T E

1 If symbol"_" is displeyed in display field of symbol being input (edited), then when inputing (editing) parameter:

- when rotating internal knob of the handle clockwise:

*- letters from **A** to **Z**,*

*- figures form **0** to **9**,*

- symbol "+" if first symbol of parameter is being input (edited), symbol "_", if subsequent symbols of parameter are being input (edited),

are displayed serially.

- when rotating internal knob of the handle counterclockwise:

- symbol "+" if first symbol of parameter is being input (edited), symbol "_", if subsequent symbols of parameter are being input (edited);

*- figures form **9** to **0**,*

*- letters from **Z** to **A***

are displayed serially.

2 If symbol different from symbol "_" is displaeyd in display field of symbol being input (edited), then when inputing (editing) parameter, display of symbols starts with symbol displayed before beginning of input (editing).

To input parameters with a line of specified values:

- set highlight to display field of parameter which value it is necessary to input;
- turn internal knob of the handle one position further. Pop-up window with a list of possible values for parameter being input is displayed on RICU (figure J.1.4);

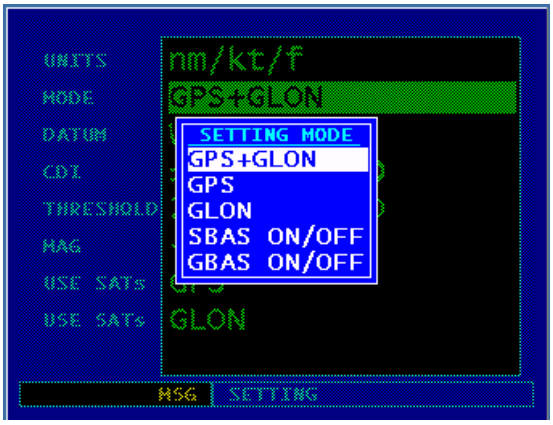


Figure J.1.4

- by rotating external knob of the handle, fix highlight to parameter value to be input;
- to confirm parameter input press ENT.

Ways of flight execution

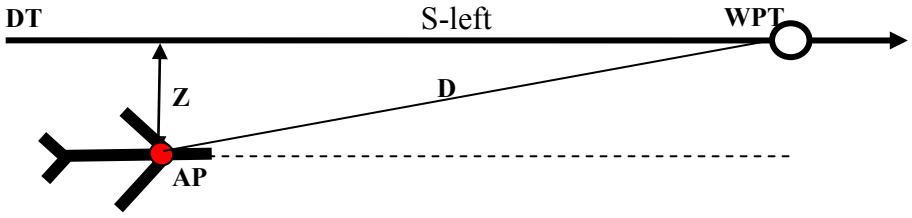
Equipment ensures execution of the flight on DT on great circle track (orthodromy) to put AC to WP by route way.

Route way of flight execution on DT and delivery of AC to WP – it is the flight within fixed air route defined by required flight plan.

When executing route way of the flight along DT, equipment makes a continuous computation of deviation from DT (linear lateral deviation - Z), distance left along DT to IWP (S-left) and distance from aircraft position to WP(D) (see figure J.1.5).

Values of distance from aircraft position to WP (**DIS**) and linear lateral deviation (deviation scale from DT and parameter **XTK**) are indicated on **NAV1** page of display of equipment CH-3301.

Equipment generates signal of deviation from DT (to control AC manually) and signal "**Selected roll**" to control AC automatically.



Z – linear lateral deviation
S-left – distance on DT left to current WP
AP – aircraft position
D – distance from aircraft position to WP.

Figure J.1.5

All the flight according set flight plan consists of consistent leaving one WP for another one along DT.

To avoid going out of aircraft beyond the limits of airway width during a turn and a transition from one flight plan leg to another, equipment carries out computation of linear allowance of a turn and beginning of turn prior to aircraft going to WP along the arc of inscribed circle of optimal radius (see figure J.1.6 a).

Linear allowance of a turn is computed for maximum angle of list of AC.

LLT is calculated depending on true airspeed, angle of turn, direction and speed of the wind.

While flying over WP, an aircraft is moving along the trajectory, defined as arc of inscribed circle with a radius R.

Notes

1 When approaching turn start point or when crossing bisector of angle, created by adjacent legs of the flight plan, depending on which occurs first, equipment stops to trace previous WP and begins to trace the next WP, and in connection with this the change of all indicating parameters takes place on the display.

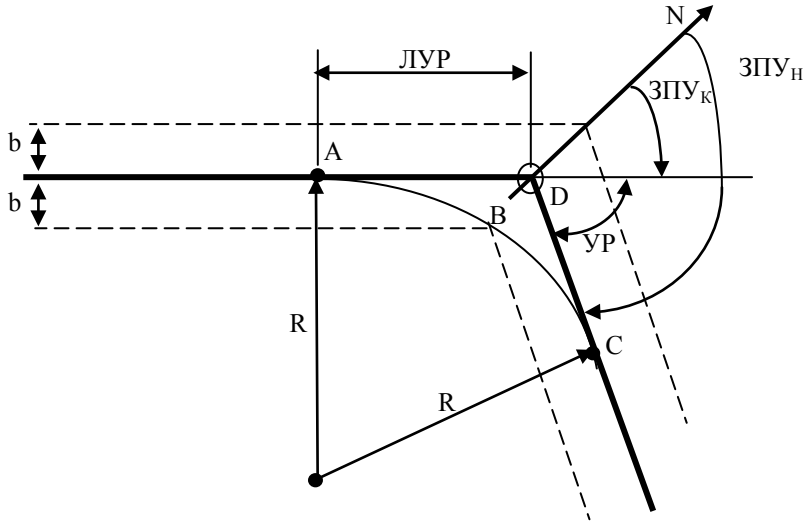
2 When angles of turn are more than 130°, LLT forms two turn radiuses (see figure J.1.6 б), defined by true airspeed of AC, maximal angle of list of AC, direction and speed of the wind. Transition of AC to the next leg of the flight plan is executed along a special trajectory:

- turn with maximum possible aircraft list along the circle with radius R;

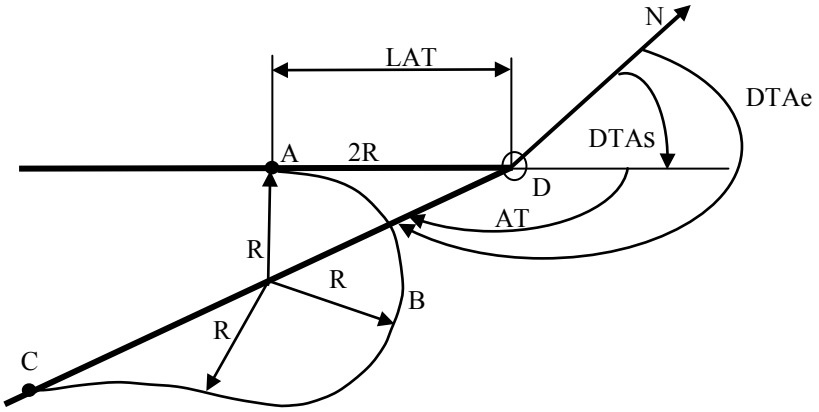
- flight with zero aircraft list at an angle 45 ° to DT;

- additional turn for a smooth getting to DT.

.



а) change of flight plan legs at an angle of the turn < 130°

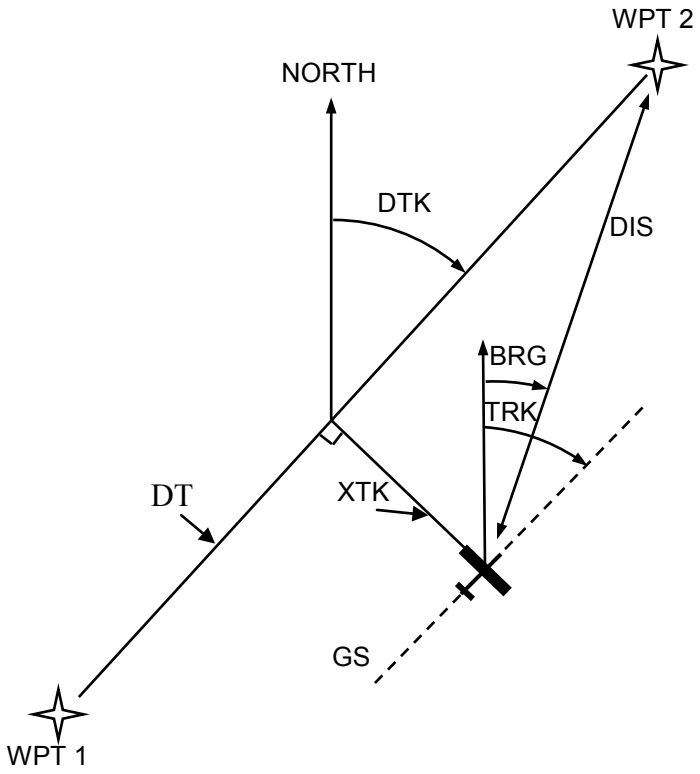


б) change of flight plan legs at an angle of the turn > 130°

A	- turn start point
B	- point on actual track
C	- turn completion point
D	- intermediate WPT
DC	- new leg of a flight plan
b	- semi-width of airway
LAT	- linear allowance of a turn
R	- radius of turn circle
AT	- angle of the turn AT = DTAs - DTAe
N	- direction to the north
DTAs	- desired track angle of the leg «AD»
DTAe	- desired track angle of the leg «DC»

Figure J.1.6

Graphic representation of parameters defined when executing the flight along DT is shown in figure J.1.7.



NORTH	– direction to the north
WPT1, WPT2	– waypoints
DT	– desired track
DTK (desired track)	– desired track angle
BRG (bearing)	– bearing to target point
TRK (track)	– actual track angle
DIS (distance)	– distance between current aircraft position and target point
GS (ground speed)	– speed relative to ground
XTK (crosstrack error)	– deviation from desired track

Figure J.1.7

Diagrammatic display of the flight in **DIRECT TO** mode is shown in figures J.1.8-J.1.10.

When executing the flight in **DIRECT TO** mode to TP not included in active flight plan, the overflight of target value is always effected.

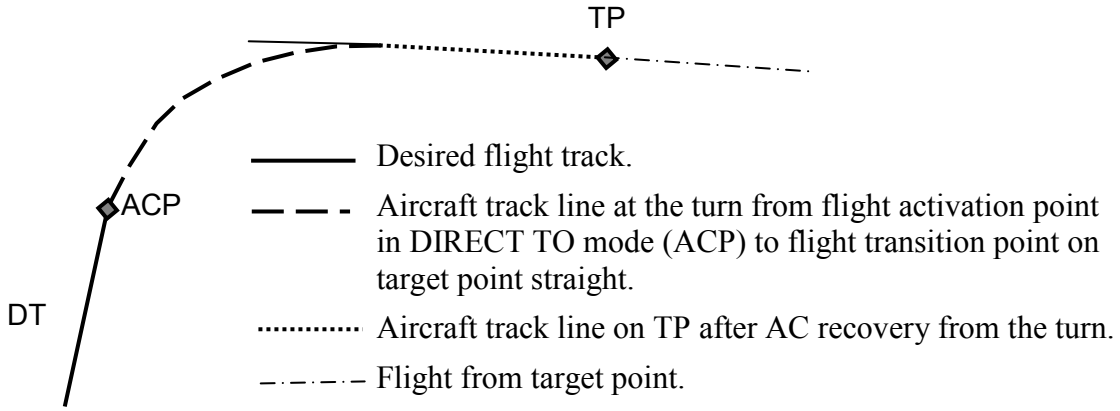

TP
ACP
DT
Desired flight track.
Aircraft track line at the turn from flight activation point in DIRECT TO mode (ACP) to flight transition point on target point straight.
Aircraft track line on TP after AC recovery from the turn.
Flight from target point.

Figure J.1.8 – Scheme of the flight in **DIRECT TO** mode to TP not included in active flight plan

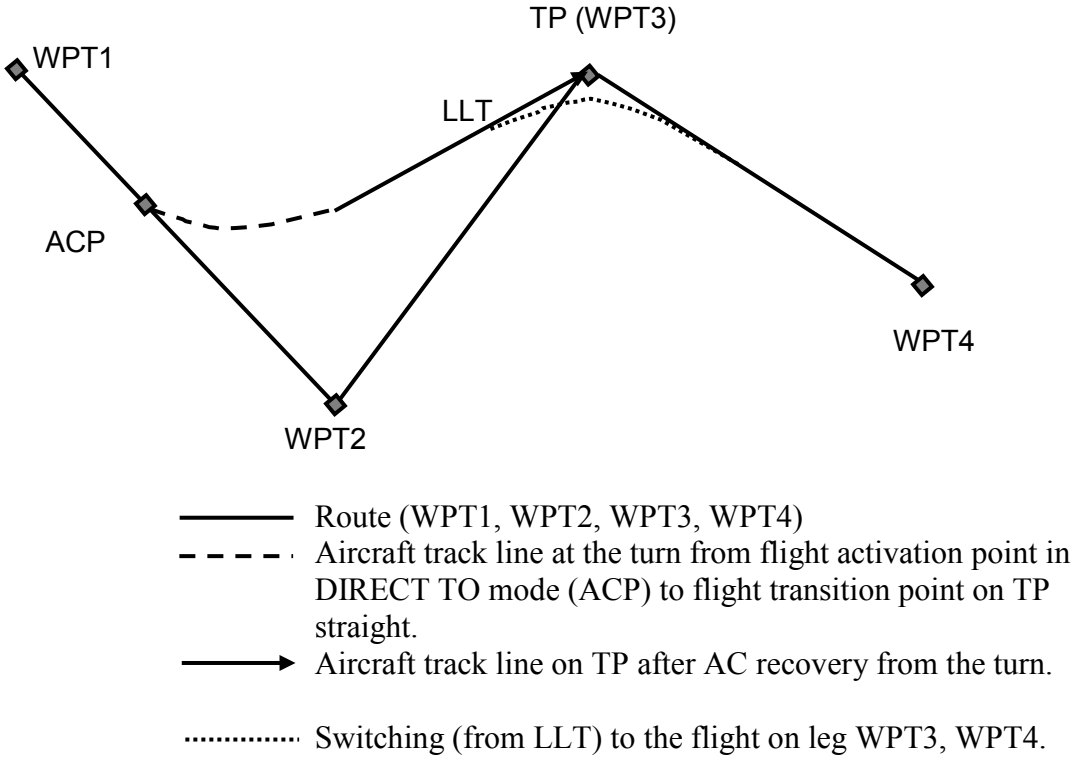

TP (WPT3)
WPT1
LLT
ACP
WPT4
WPT2
Route (WPT1, WPT2, WPT3, WPT4)
Aircraft track line at the turn from flight activation point in DIRECT TO mode (ACP) to flight transition point on TP straight.
Aircraft track line on TP after AC recovery from the turn.
Switching (from LLT) to the flight on leg WPT3, WPT4.

Figure J.1.9 – Scheme of the flight in **DIRECT TO** mode to TP included in active flight plan

After flyover of target point (WPT2), flight in **DIRECT TO** mode is cancelled and the flight is executed according to flight plan.

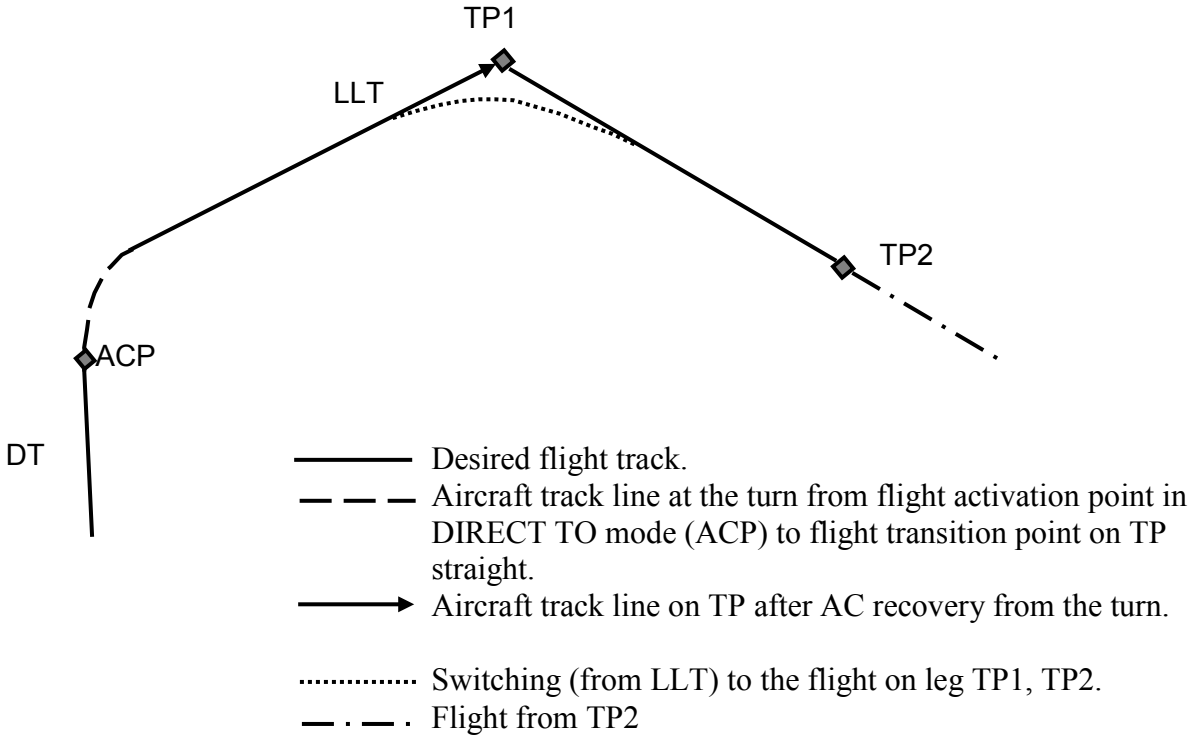

TP1
LLT
TP2
ACP
DT
Desired flight track.
Aircraft track line at the turn from flight activation point in DIRECT TO mode (ACP) to flight transition point on TP straight.
Aircraft track line on TP after AC recovery from the turn.
Switching (from LLT) to the flight on leg TP1, TP2.
Flight from TP2

Figure J.1.10 – Scheme of the flight in **DIRECT TO** mode with TP2 being in turn

Diagrammatic representation of the flight in **OFFSET** mode is shown in figures J.1.11-J.1.13.

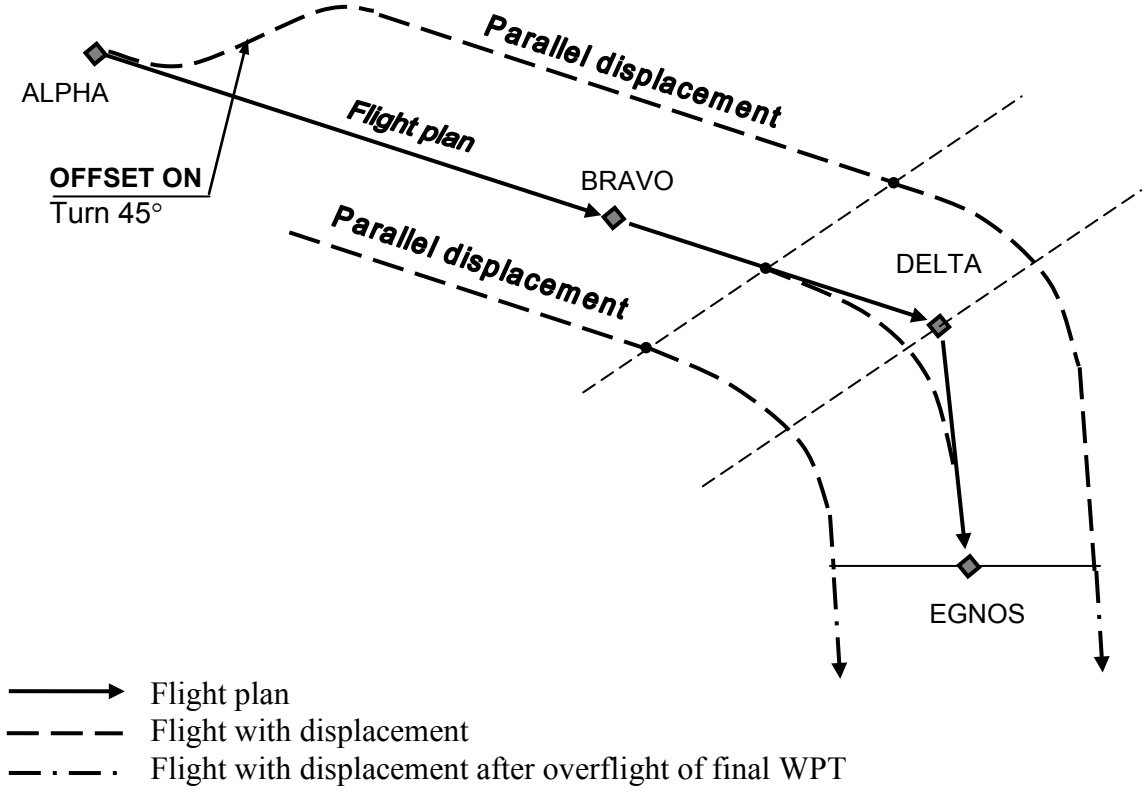


Figure J.1.11 - Scheme of flight on a displaced flight plan

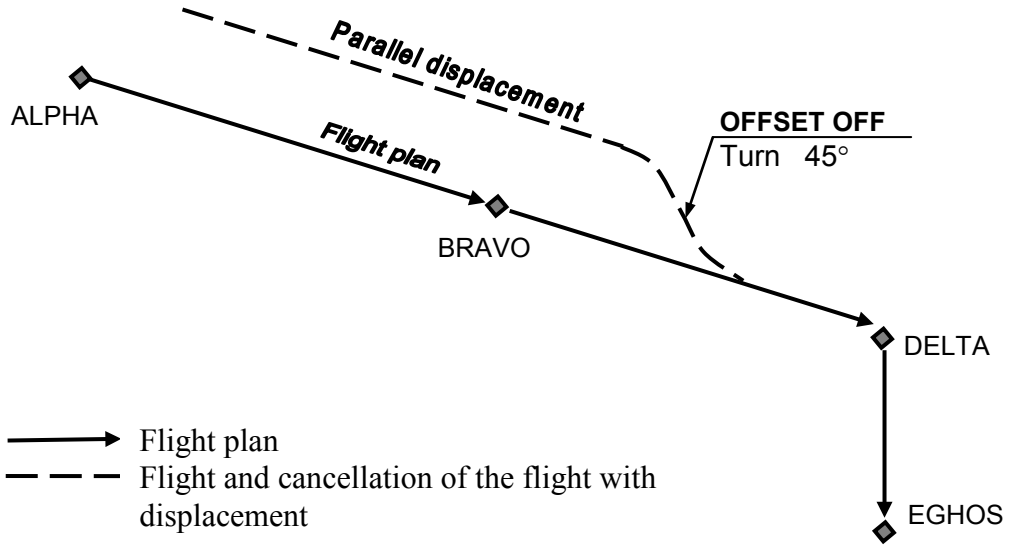


Figure J.1.12 – Scheme of cancellation of the flight according to displaced flight plan

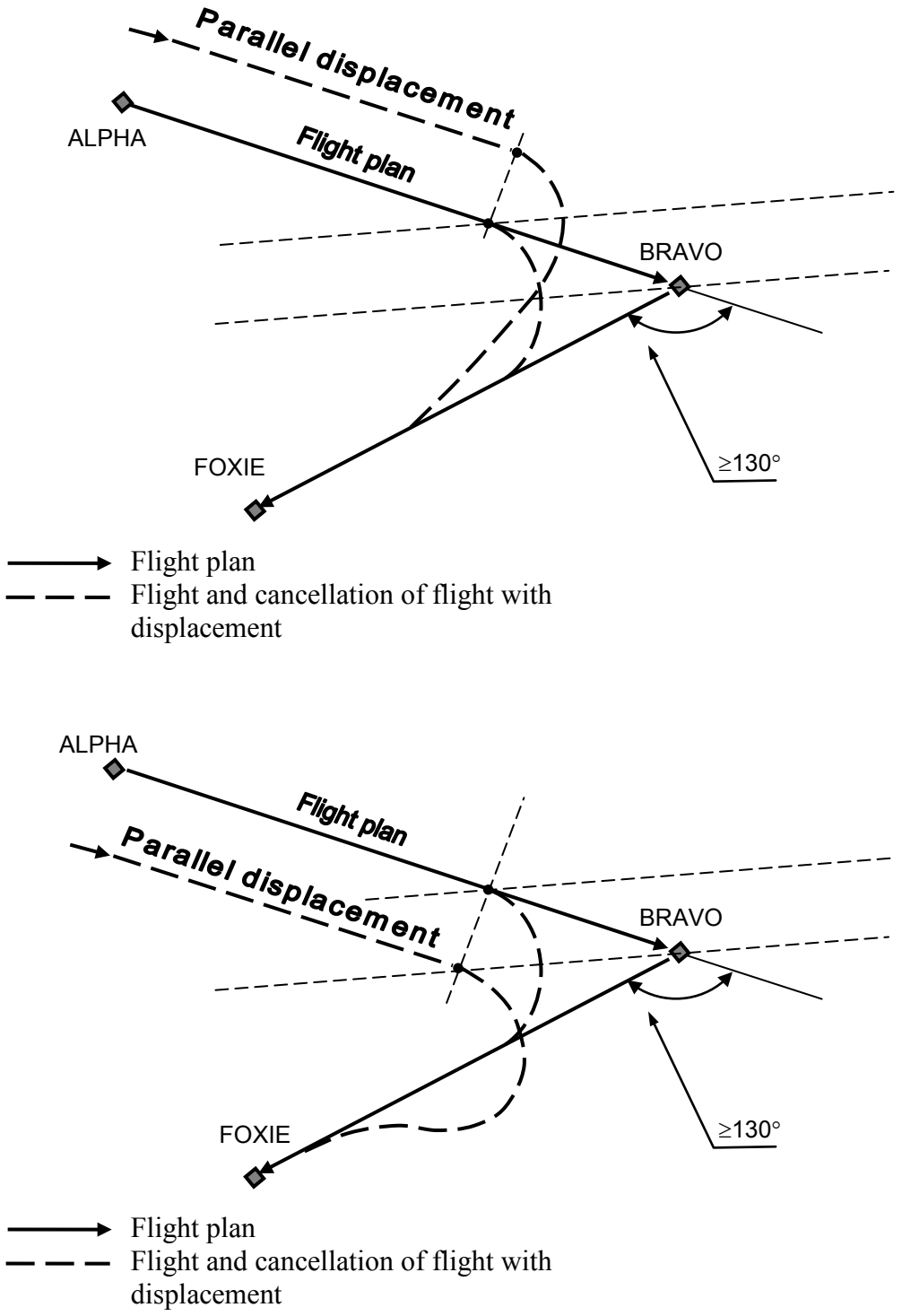


Figure J.1.13 – Scheme of cancellation of flight according to displaced flight plan when executing a turn for angle more than 130°

Logical tree of apparatus forms

Logical tree of access to pages and windows of each form and functions, being accomplished on pages and windows of a form are shown in figures J.1.14 – J.1.21.

Note –Active handle is marked in black.

Logical tree of NAV form

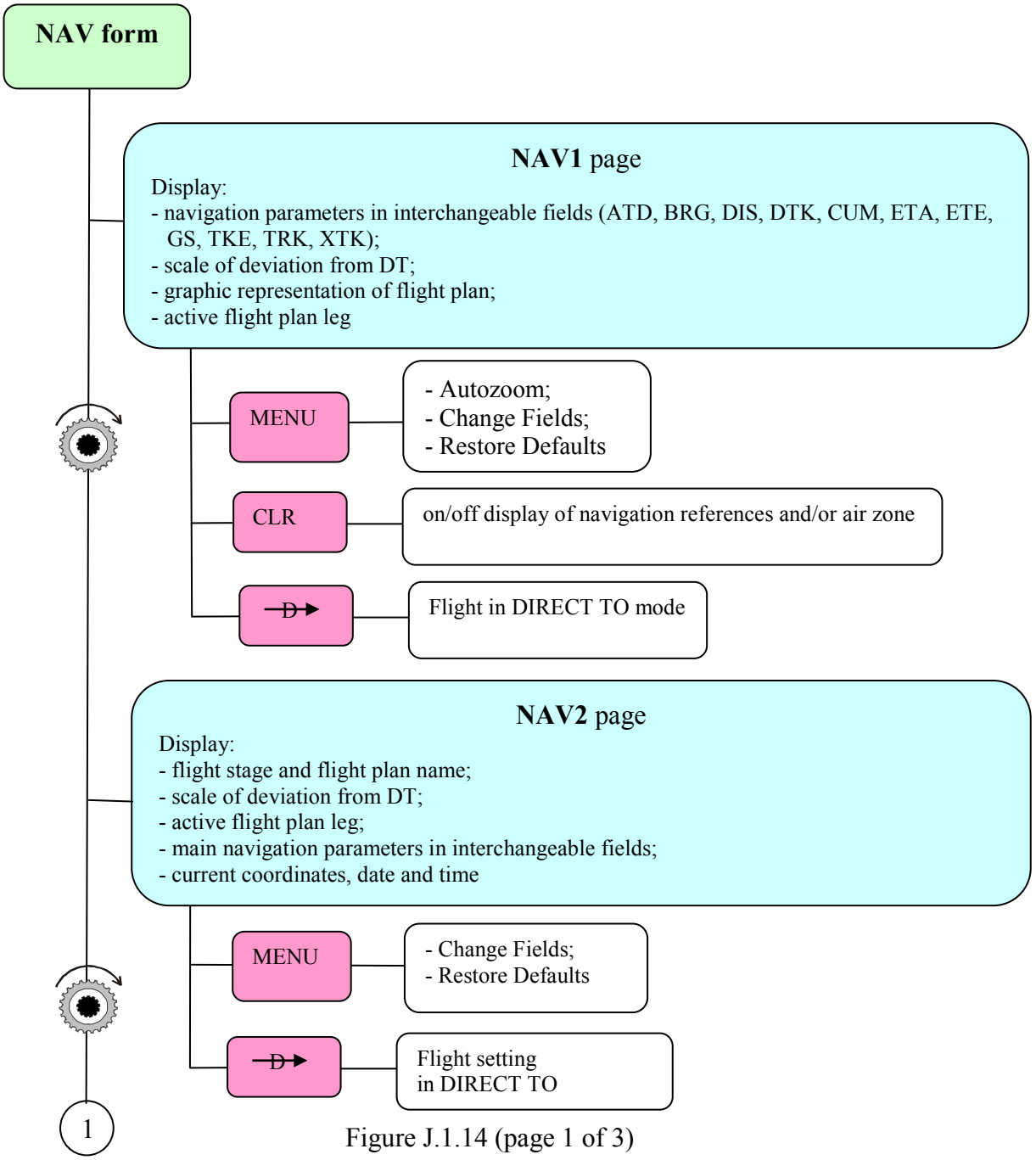

NAV form
NAV1 page
Display:
- navigation parameters in interchangeable fields (ATD, BRG, DIS, DTK, CUM, ETA, ETE, GS, TKE, TRK, XTK);
- scale of deviation from DT;
- graphic representation of flight plan;
- active flight plan leg
MENU
- Autozoom;
- Change Fields;
- Restore Defaults
CLR
on/off display of navigation references and/or air zone
D
Flight in DIRECT TO mode
NAV2 page
Display:
- flight stage and flight plan name;
- scale of deviation from DT;
- active flight plan leg;
- main navigation parameters in interchangeable fields;
- current coordinates, date and time
MENU
- Change Fields;
- Restore Defaults
D
Flight setting in DIRECT TO
1

Figure J.1.14 (page 1 of 3)

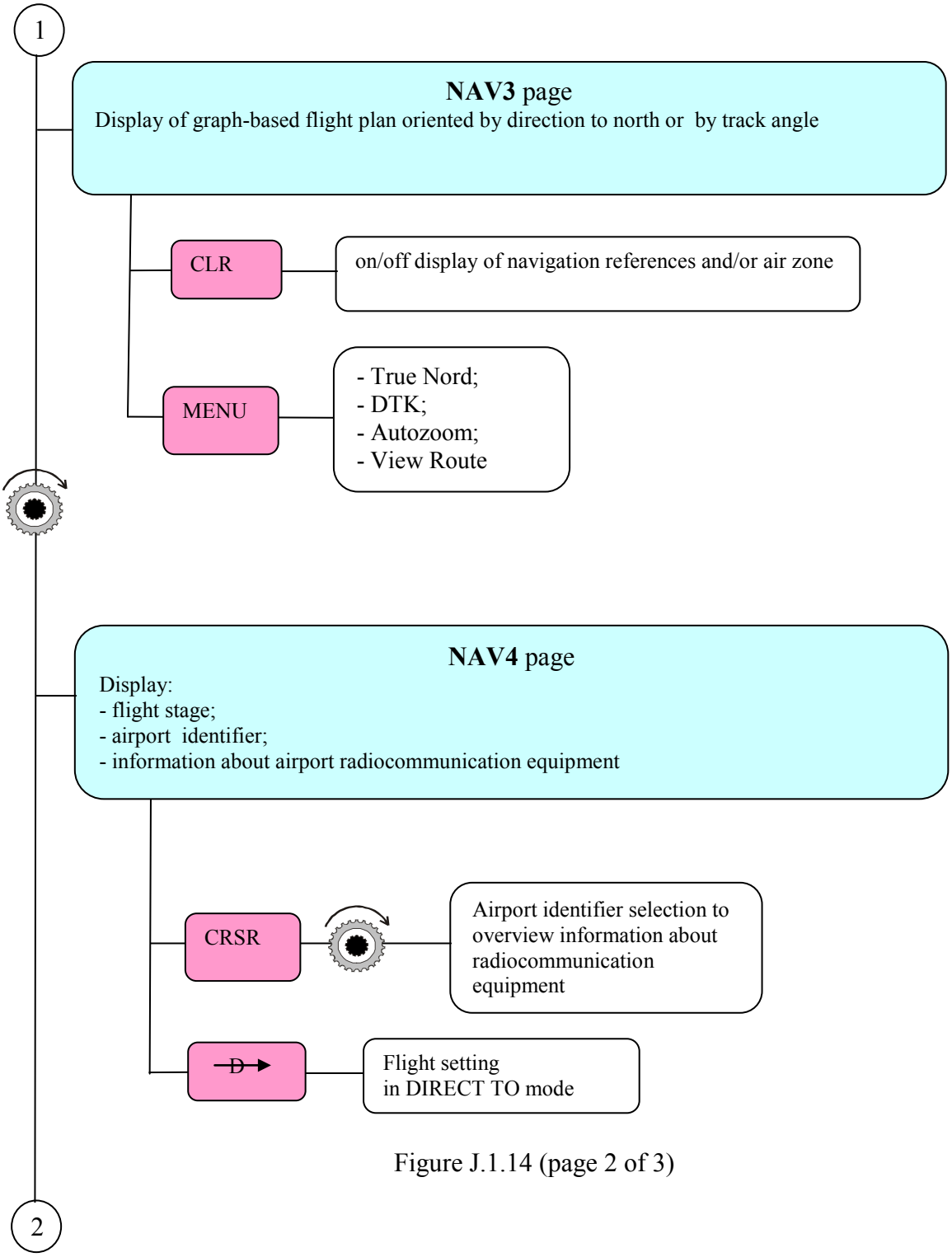


Figure J.1.14 (page 2 of 3)

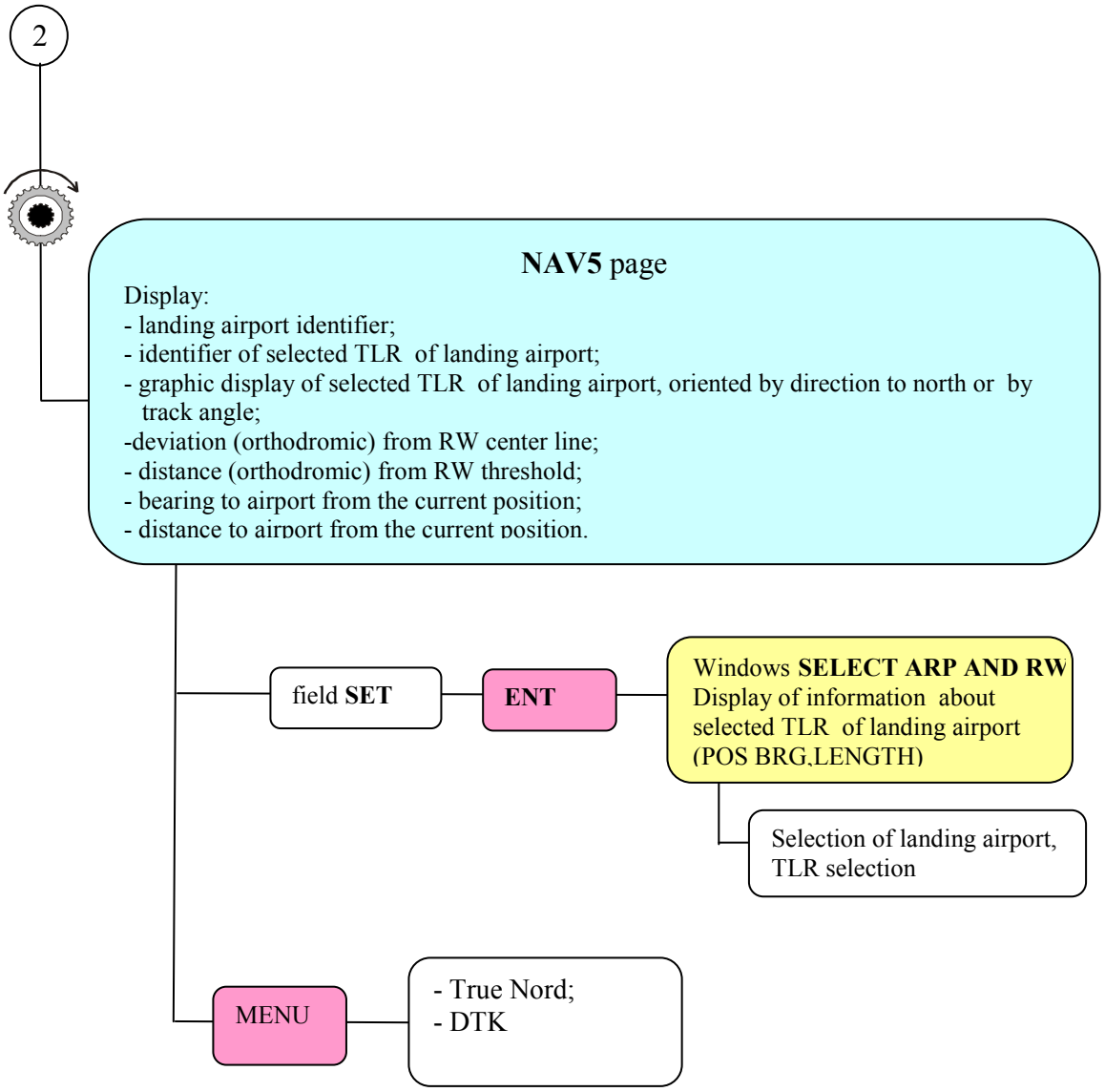

2
NAV5 page
Display:
- landing airport identifier;
- identifier of selected TLR of landing airport;
- graphic display of selected TLR of landing airport, oriented by direction to north or by track angle;
-deviation (orthodromic) from RW center line;
- distance (orthodromic) from RW threshold;
- bearing to airport from the current position;
- distance to airport from the current position.
field SET
ENT
Windows SELECT ARP AND RW
Display of information about selected TLR of landing airport (POS BRG,LENGTH)
Selection of landing airport, TLR selection
MENU
- True Nord;
- DTK

Figure J.1.14 (page 3 of 3)

Logical tree of FPL form

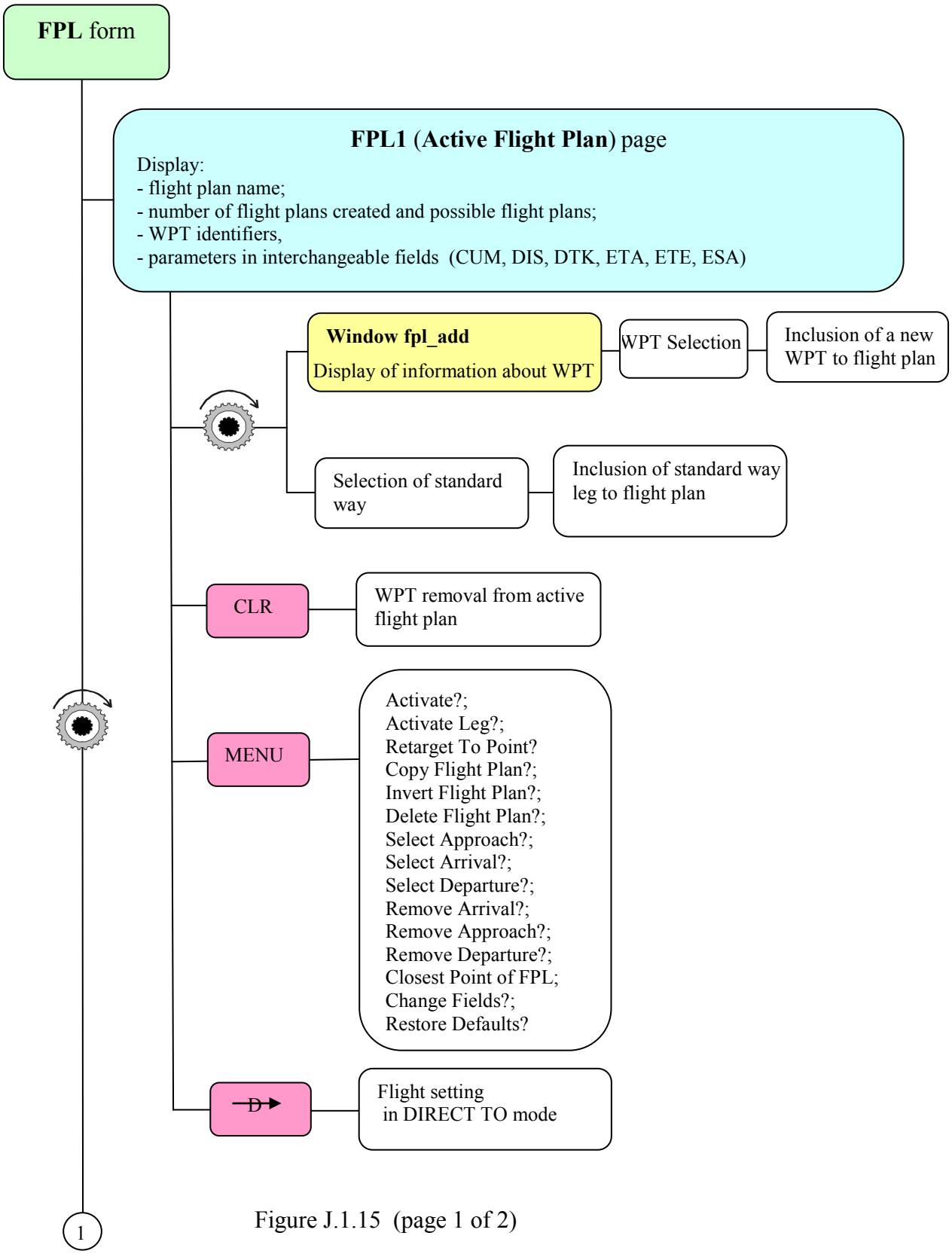


Figure J.1.15 (page 1 of 2)

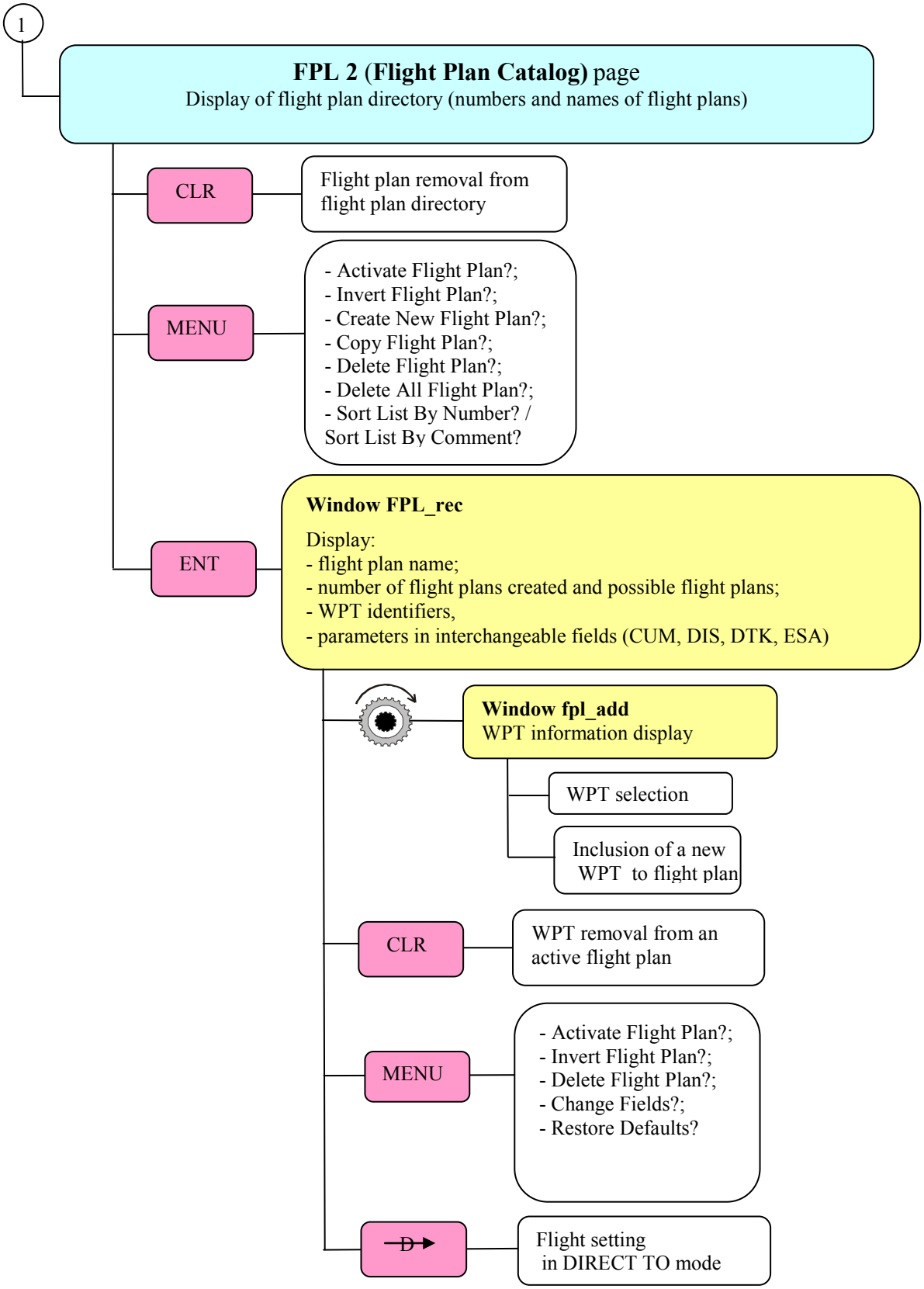

1
FPL 2 (Flight Plan Catalog) page
Display of flight plan directory (numbers and names of flight plans)
CLR
Flight plan removal from flight plan directory
MENU
- Activate Flight Plan?;
- Invert Flight Plan?;
- Create New Flight Plan?;
- Copy Flight Plan?;
- Delete Flight Plan?;
- Delete All Flight Plan?;
- Sort List By Number? / Sort List By Comment?
ENT
Window FPL_rec
Display:
- flight plan name;
- number of flight plans created and possible flight plans;
- WPT identifiers,
- parameters in interchangeable fields (CUM, DIS, DTK, ESA)
Window fpl_add
WPT information display
WPT selection
Inclusion of a new WPT to flight plan
CLR
WPT removal from an active flight plan
MENU
- Activate Flight Plan?;
- Invert Flight Plan?;
- Delete Flight Plan?;
- Change Fields?;
- Restore Defaults?
D
Flight setting in DIRECT TO mode

Figure J.1.15 (page 2 of 2)

Logical tree of ⊣D▸ form

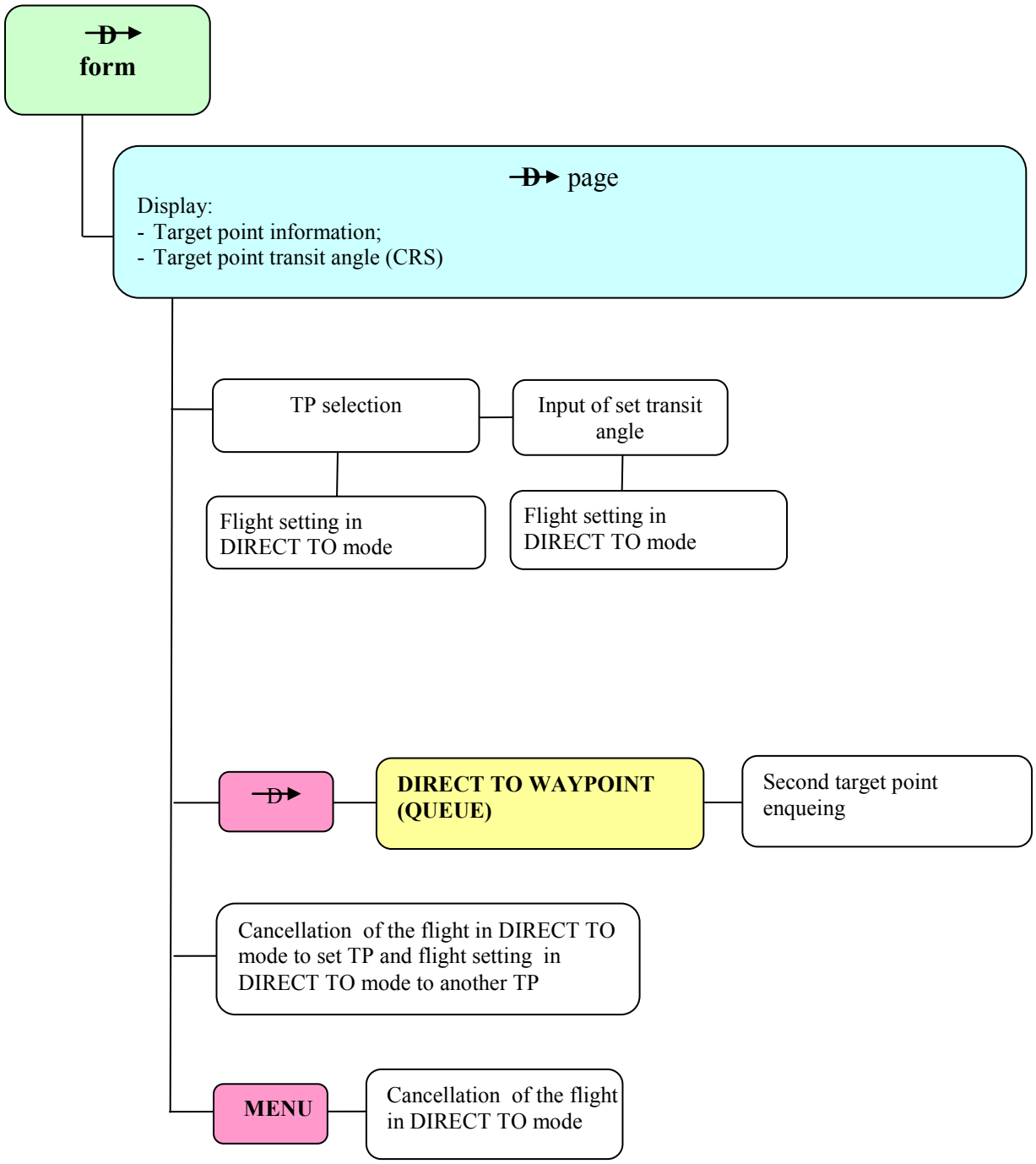

⊣D▸
form
⊣D▸ page
Display:
- Target point information;
- Target point transit angle (CRS)
TP selection
Input of set transit angle
Flight setting in DIRECT TO mode
Flight setting in DIRECT TO mode
⊣D▸
DIRECT TO WAYPOINT (QUEUE)
Second target point enqueing
Cancellation of the flight in DIRECT TO mode to set TP and flight setting in DIRECT TO mode to another TP
MENU
Cancellation of the flight in DIRECT TO mode

Figure J.1.16

Logical tree of OBS form

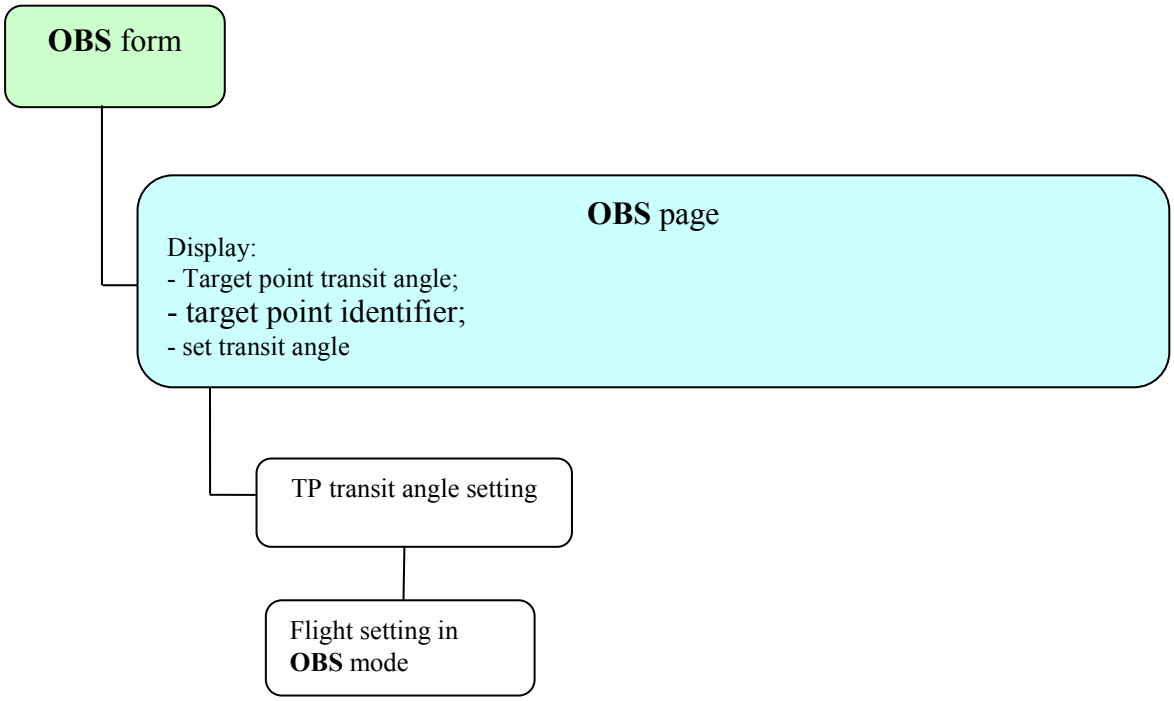


Figure J.1.17

Logical tree of WPT form

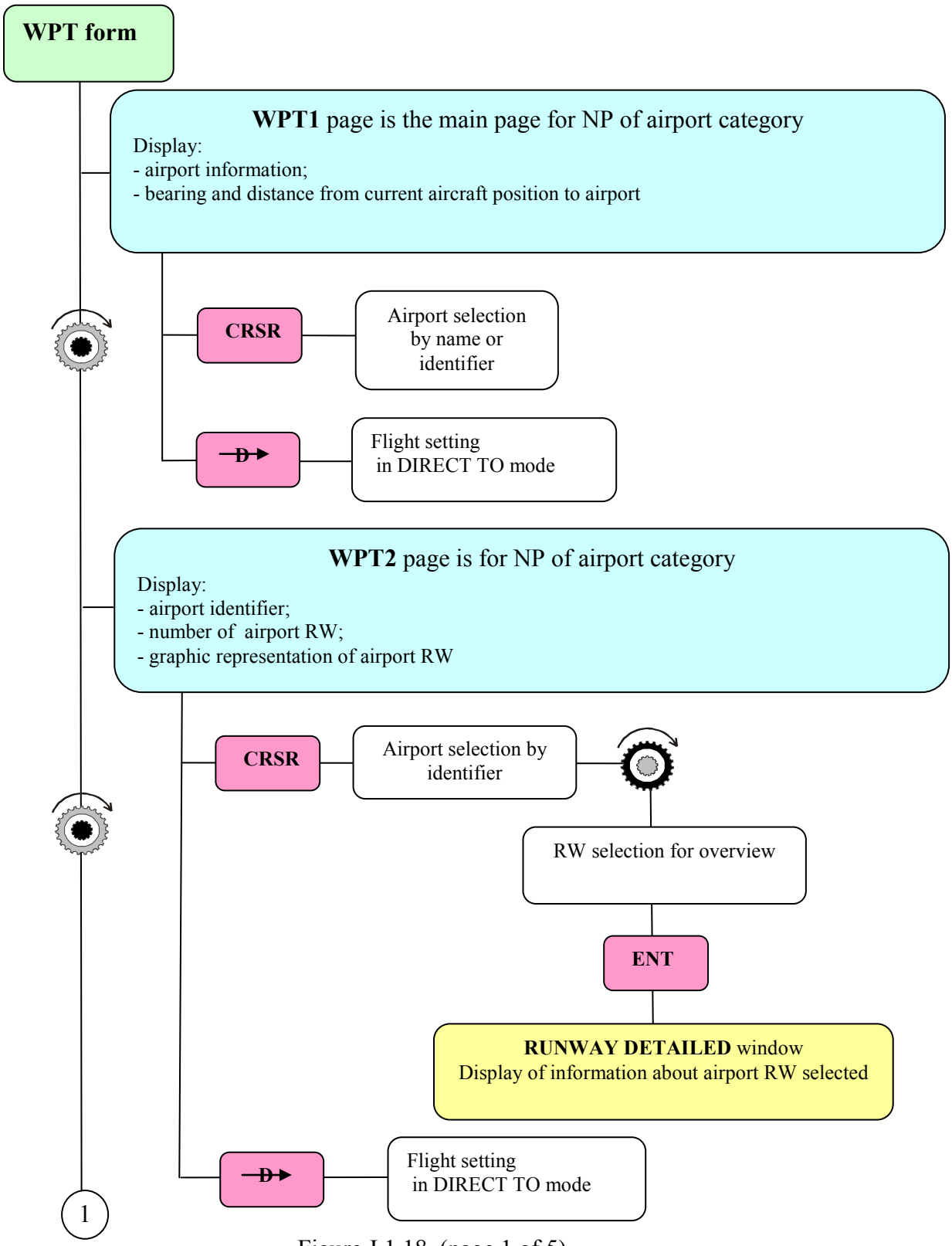

WPT form
WPT1 page is the main page for NP of airport category
Display:
- airport information;
- bearing and distance from current aircraft position to airport
CRSR
Airport selection by name or identifier
D
Flight setting in DIRECT TO mode
WPT2 page is for NP of airport category
Display:
- airport identifier;
- number of airport RW;
- graphic representation of airport RW
CRSR
Airport selection by identifier
RW selection for overview
ENT
RUNWAY DETAILED window
Display of information about airport RW selected
D
Flight setting in DIRECT TO mode
1

Figure J.1.18 (page 1 of 5)

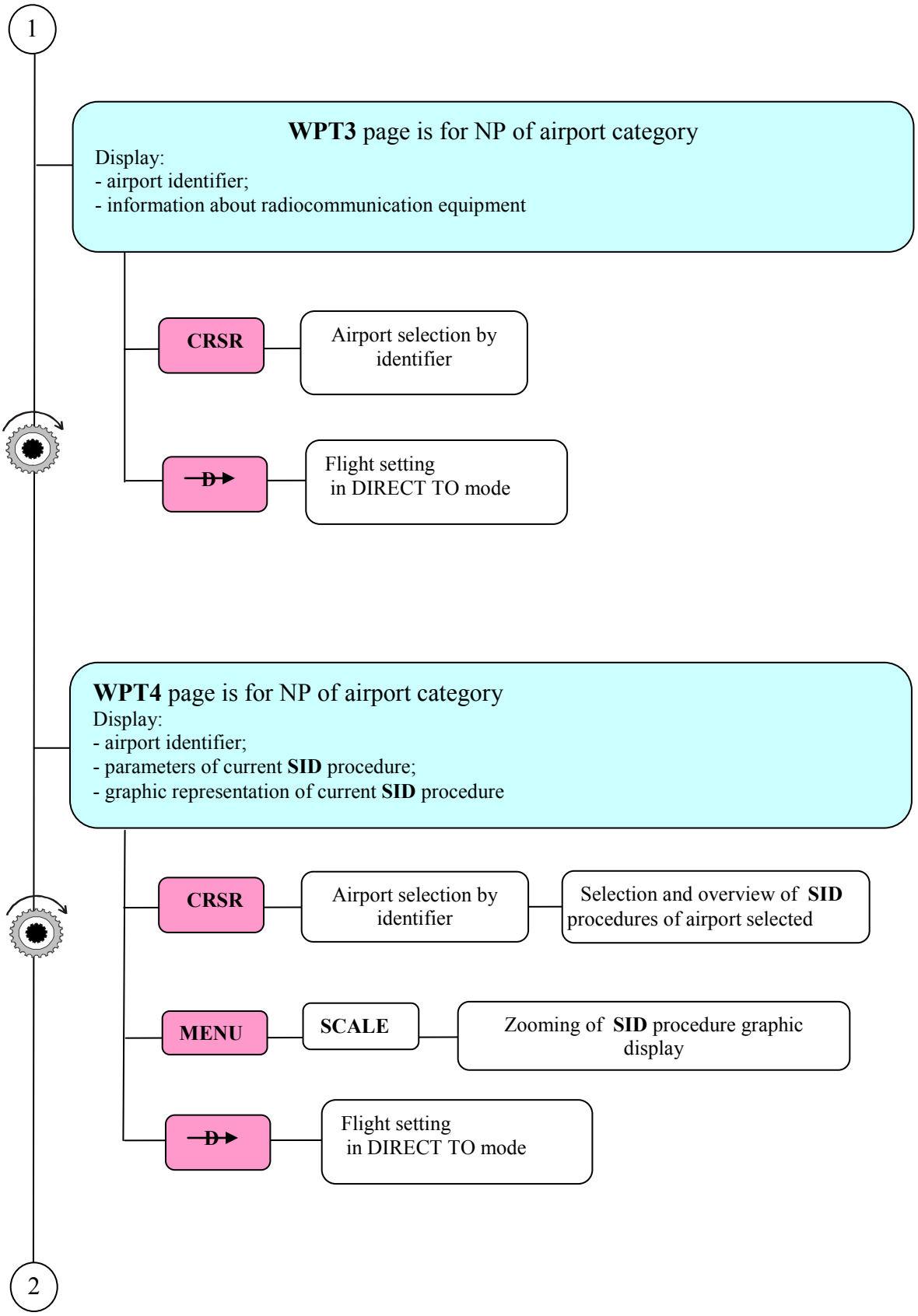


Figure J.1.18 (page 2 of 5)

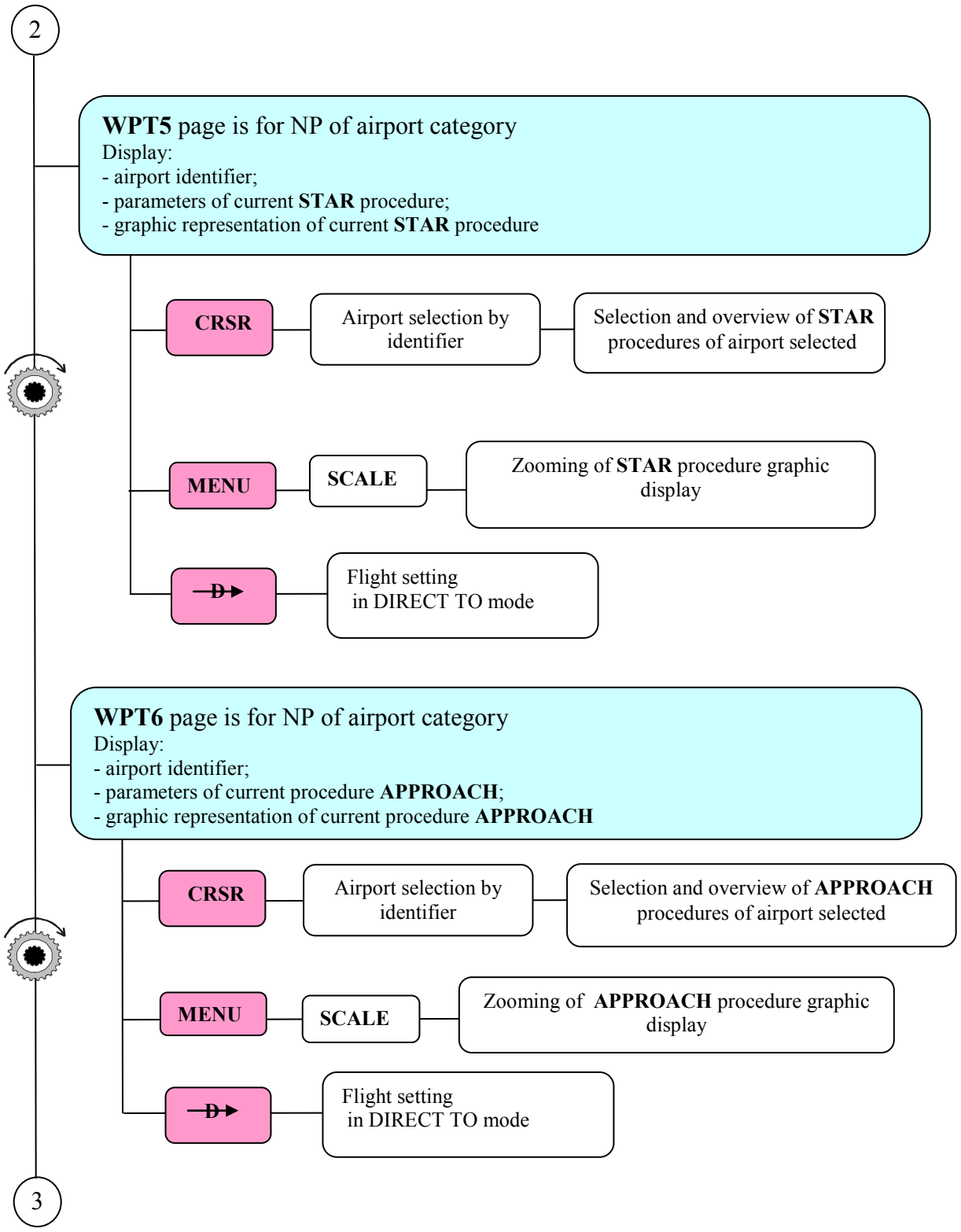


Figure J.1.18 (page 3 of 5)

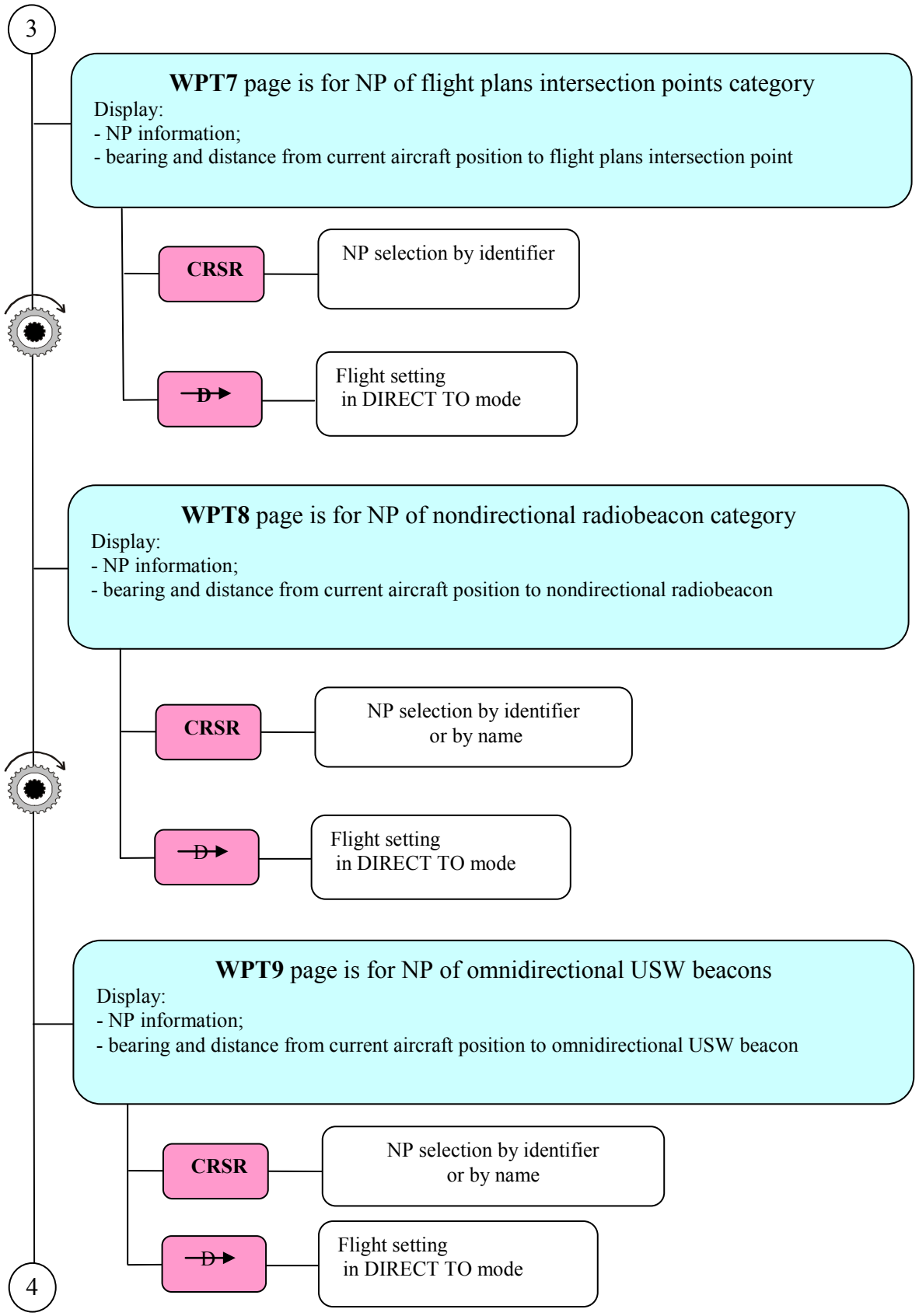


Figure J.1.18 (page 4 of 5)

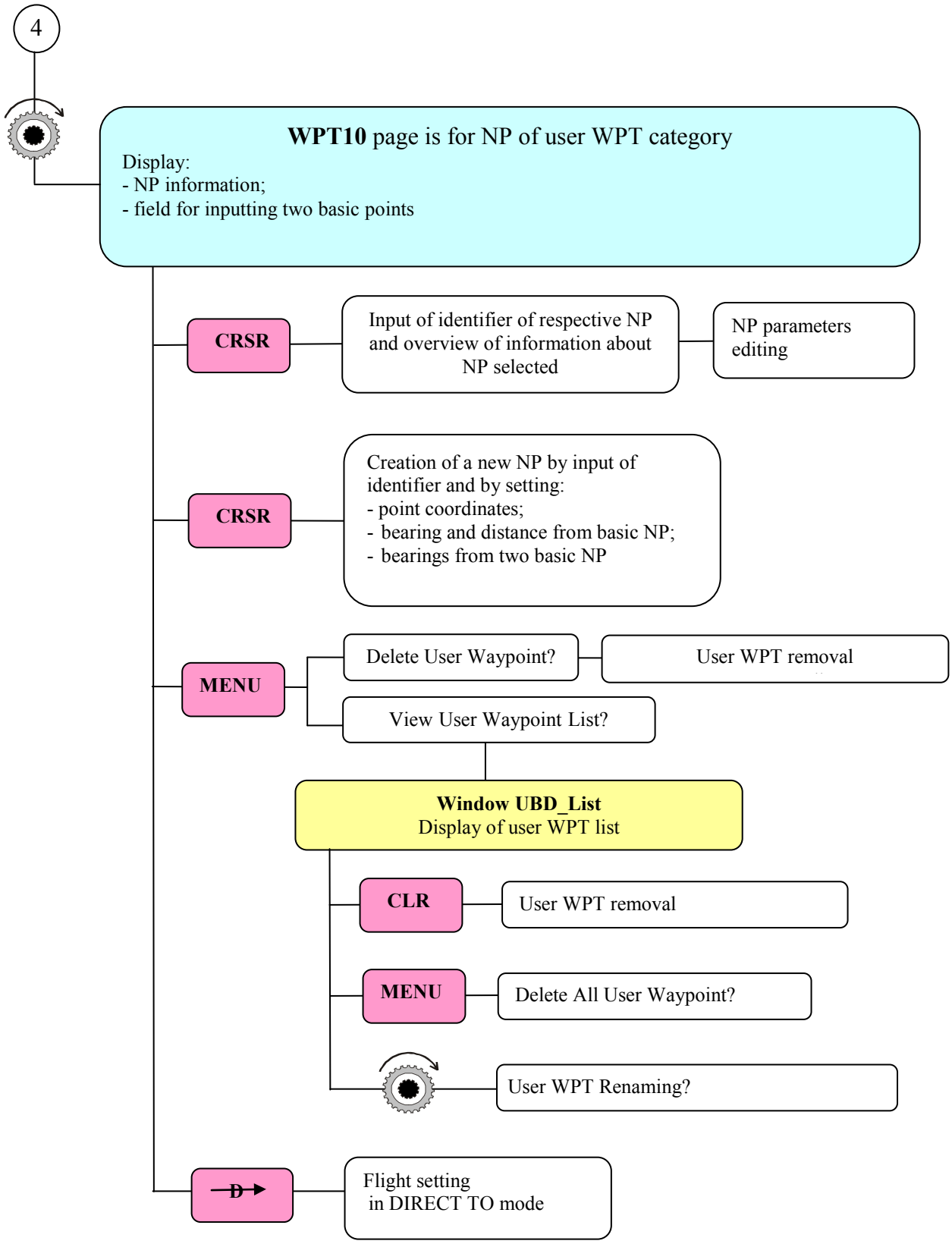

4
WPT10 page is for NP of user WPT category
Display:
- NP information;
- field for inputting two basic points
CRSR
Input of identifier of respective NP and overview of information about NP selected
NP parameters editing
CRSR
Creation of a new NP by input of identifier and by setting:
- point coordinates;
- bearing and distance from basic NP;
- bearings from two basic NP
MENU
Delete User Waypoint?
User WPT removal
View User Waypoint List?
Window UBD_List
Display of user WPT list
CLR
User WPT removal
MENU
Delete All User Waypoint?
User WPT Renaming?
D
Flight setting in DIRECT TO mode

Figure J.1.18 (page 5 of 5)

Logical tree of NRST form

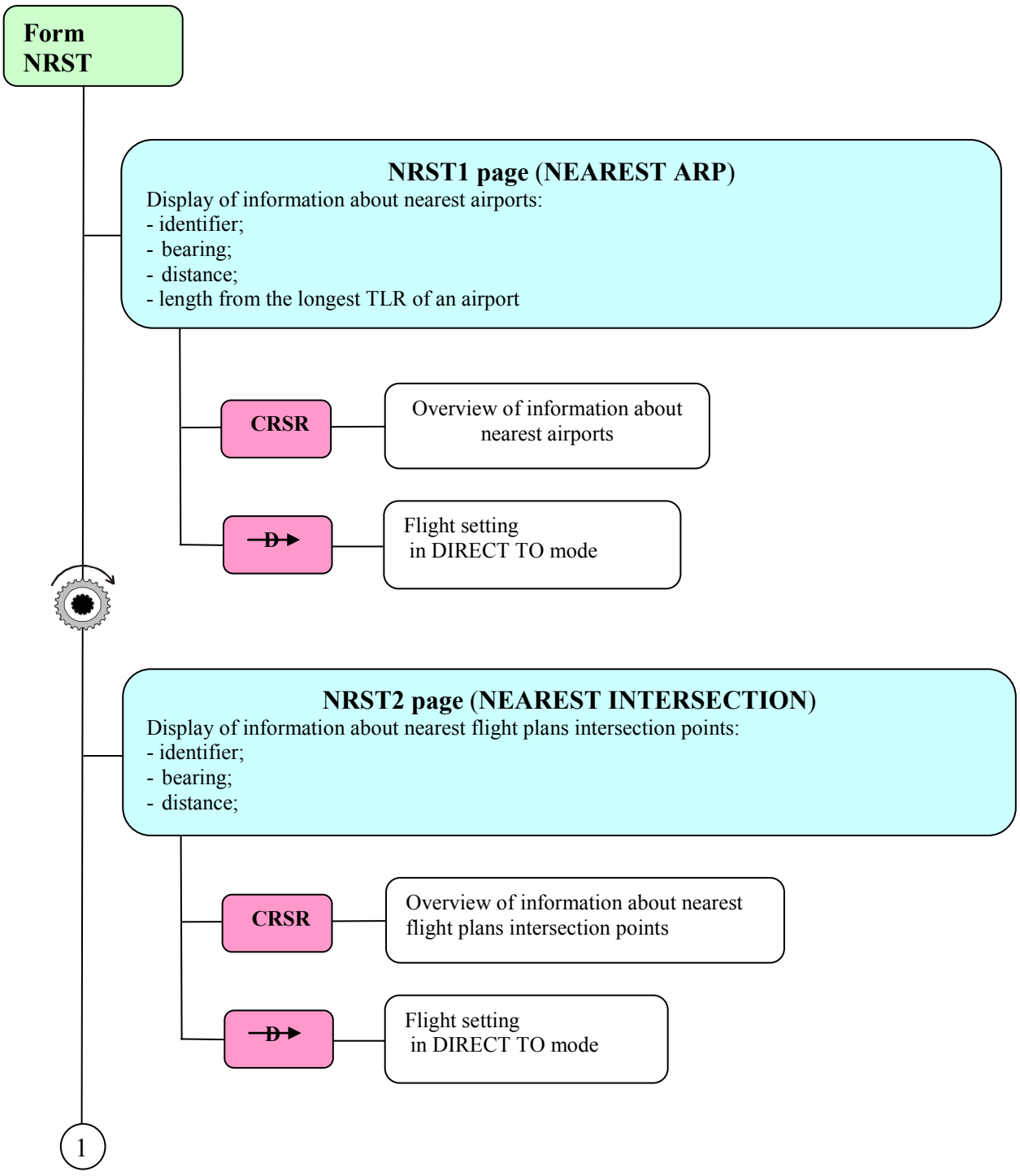


Figure J.1.19 (page 1 of 2)

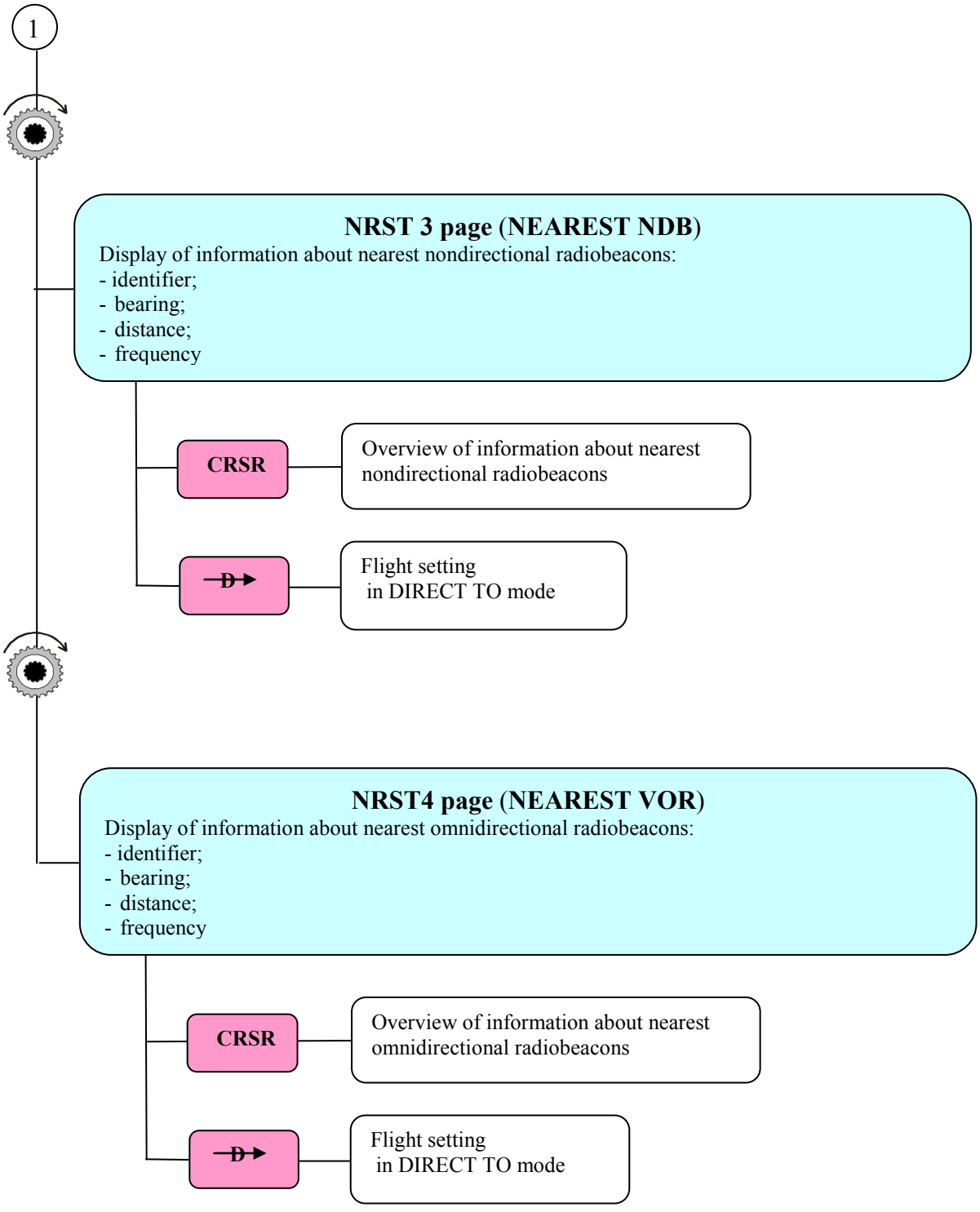


Figure J.1.19 (page 2 of 2)

Logical tree of AUX form

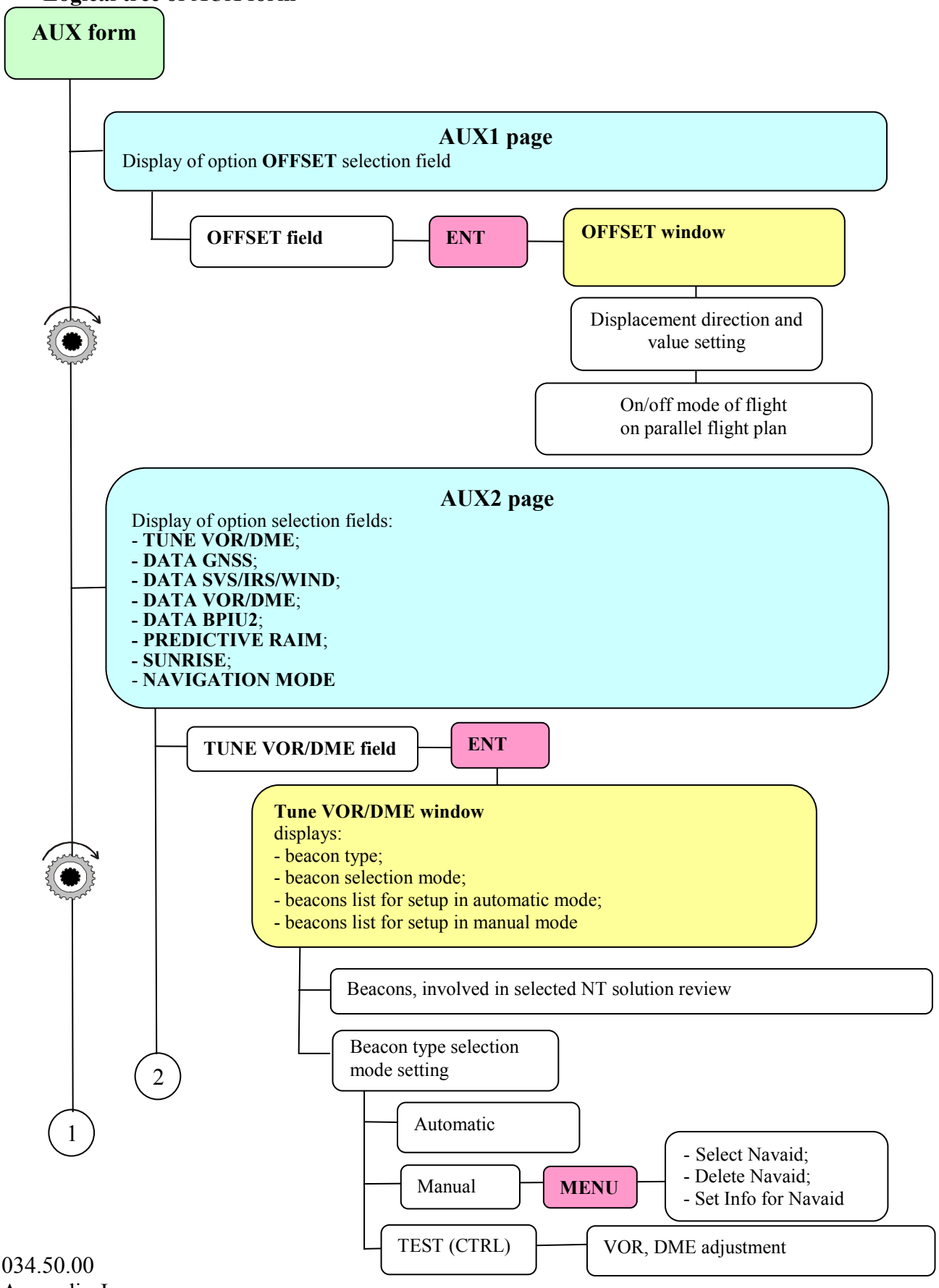


Figure J.1.20 (page 1 of 8)

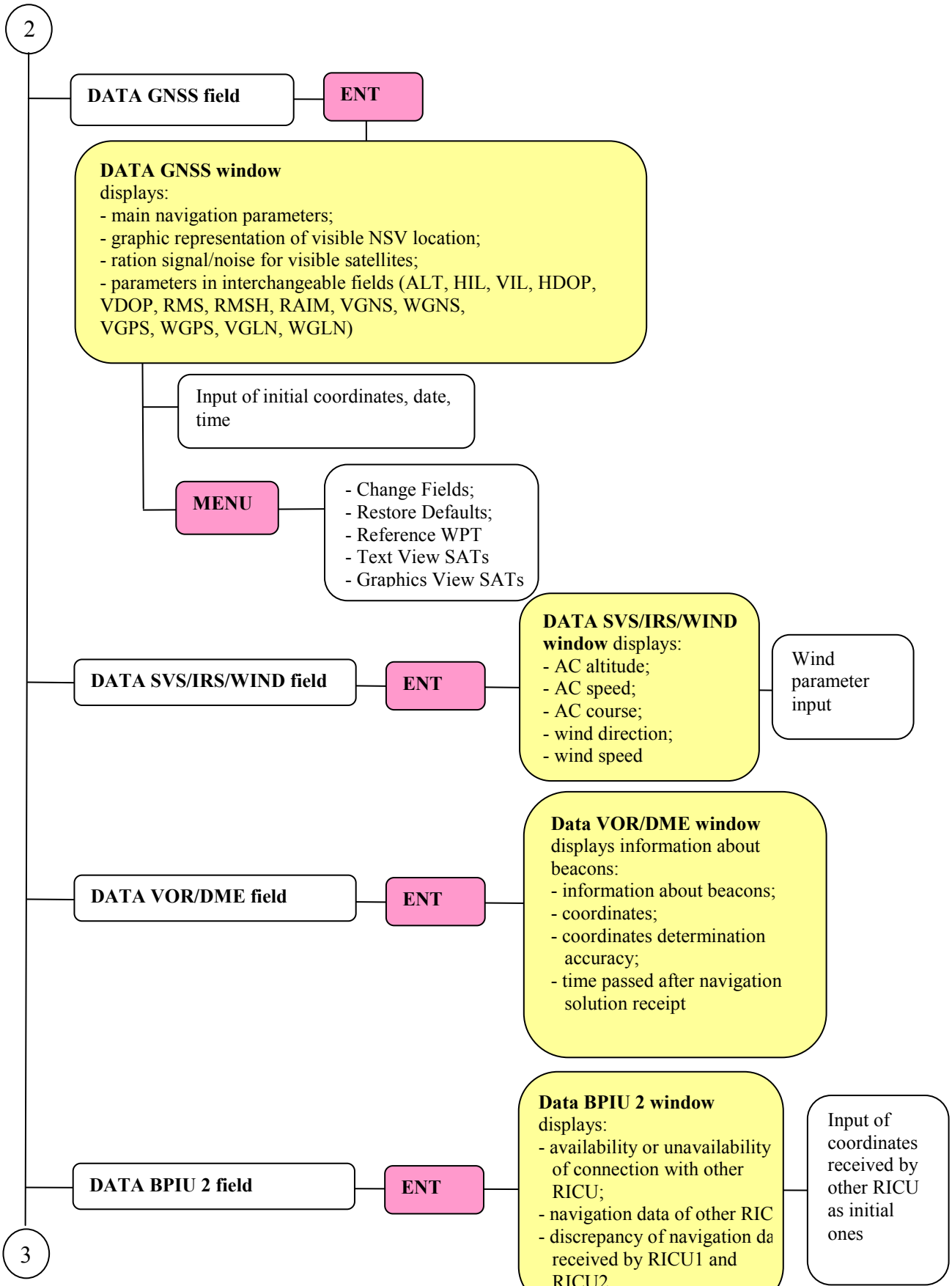

2
DATA GNSS field
ENT
DATA GNSS window
displays:
- main navigation parameters;
- graphic representation of visible NSV location;
- ration signal/noise for visible satellites;
- parameters in interchangeable fields (ALT, HIL, VIL, HDOP, VDOP, RMS, RMSH, RAIM, VGNS, WGNS, VGPS, WGPS, VGLN, WGLN)
Input of initial coordinates, date, time
MENU
- Change Fields;
- Restore Defaults;
- Reference WPT
- Text View SATs
- Graphics View SATs
DATA SVS/IRS/WIND field
ENT
DATA SVS/IRS/WIND window displays:
- AC altitude;
- AC speed;
- AC course;
- wind direction;
- wind speed
Wind parameter input
DATA VOR/DME field
ENT
Data VOR/DME window
displays information about beacons:
- information about beacons;
- coordinates;
- coordinates determination accuracy;
- time passed after navigation solution receipt
DATA BPIU 2 field
ENT
Data BPIU 2 window
displays:
- availability or unavailability of connection with other RICU;
- navigation data of other RIC
- discrepancy of navigation da received by RICU1 and RICU2
Input of coordinates received by other RICU as initial ones
3

Figure J.1.20 (page 2 of 8)

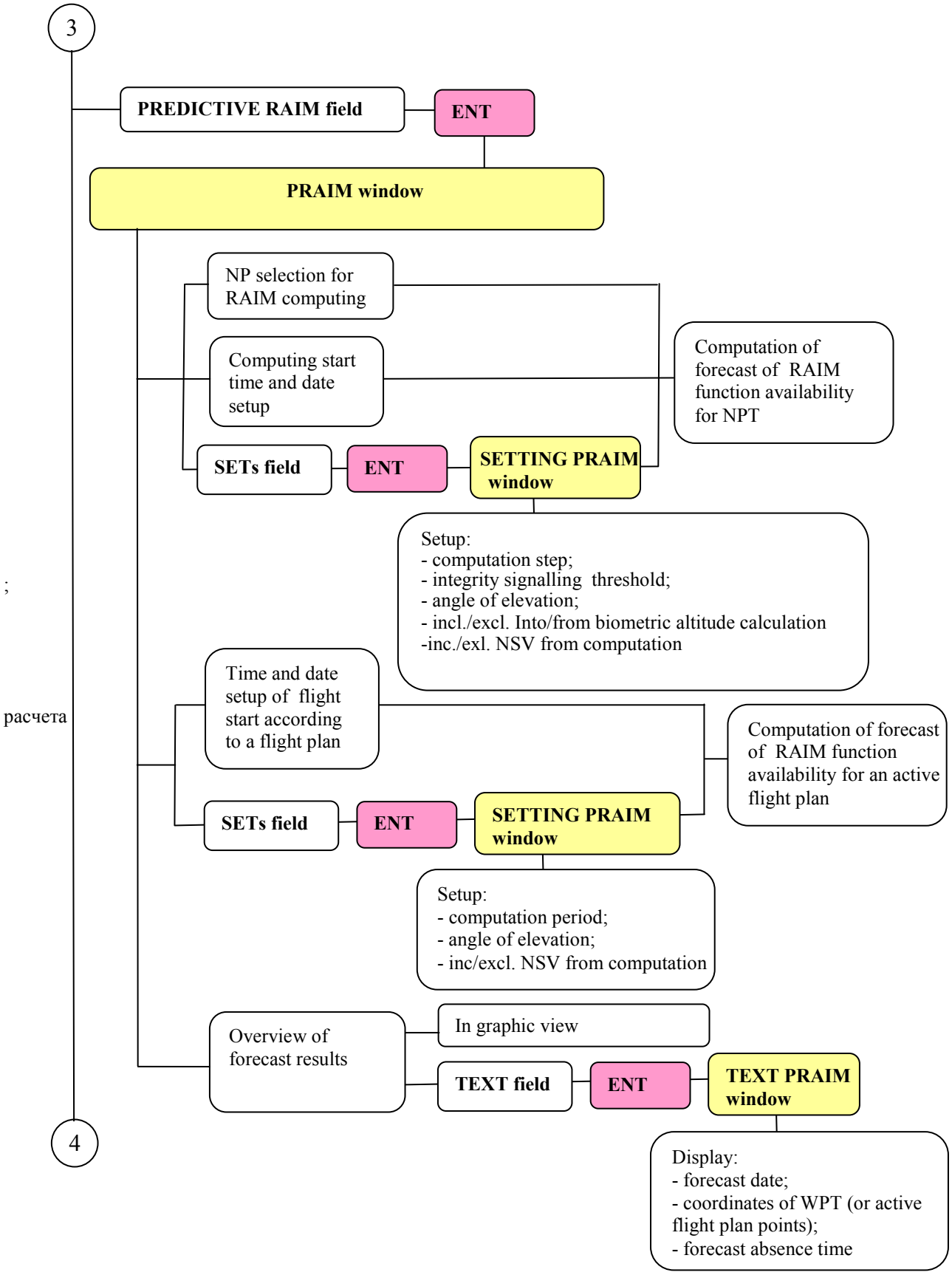

3
PREDICTIVE RAIM field
ENT
PRAIM window
NP selection for RAIM computing
Computing start time and date setup
Computation of forecast of RAIM function availability for NPT
SETs field
ENT
SETTING PRAIM window
Setup:
- computation step;
- integrity signalling threshold;
- angle of elevation;
- incl./excl. Into/from biometric altitude calculation
-inc./exl. NSV from computation
;
Time and date setup of flight start according to a flight plan
расчета
Computation of forecast of RAIM function availability for an active flight plan
SETs field
ENT
SETTING PRAIM window
Setup:
- computation period;
- angle of elevation;
- inc/excl. NSV from computation
Overview of forecast results
In graphic view
TEXT field
ENT
TEXT PRAIM window
Display:
- forecast date;
- coordinates of WPT (or active flight plan points);
- forecast absence time
4

Figure J.1.20 (page 3 of 8)

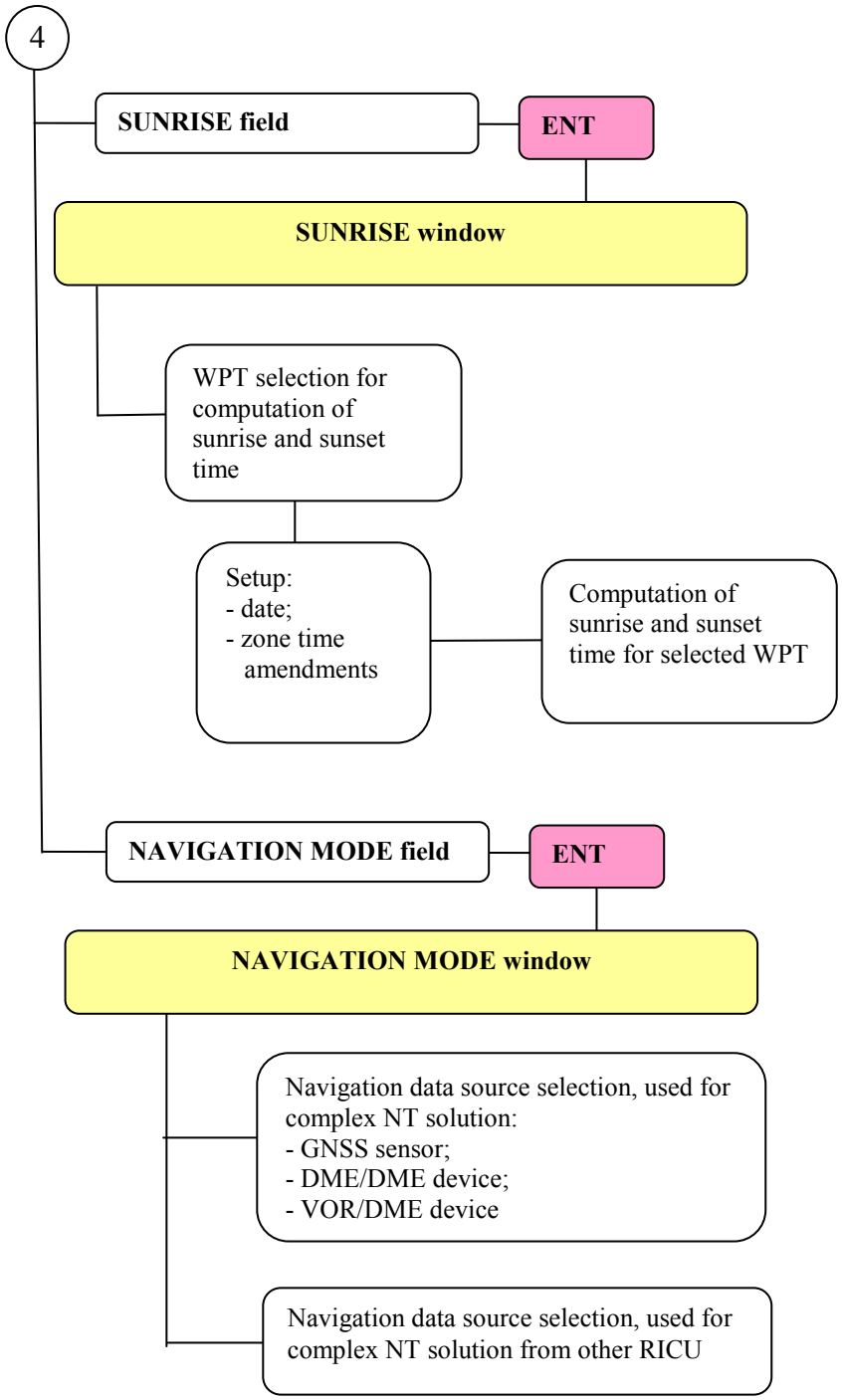

4
SUNRISE field
ENT
SUNRISE window
WPT selection for computation of sunrise and sunset time
Setup:
- date;
- zone time amendments
Computation of sunrise and sunset time for selected WPT
NAVIGATION MODE field
ENT
NAVIGATION MODE window
Navigation data source selection, used for complex NT solution:
- GNSS sensor;
- DME/DME device;
- VOR/DME device
Navigation data source selection, used for complex NT solution from other RICU

Figure J.1.20 (page 4 of 8)

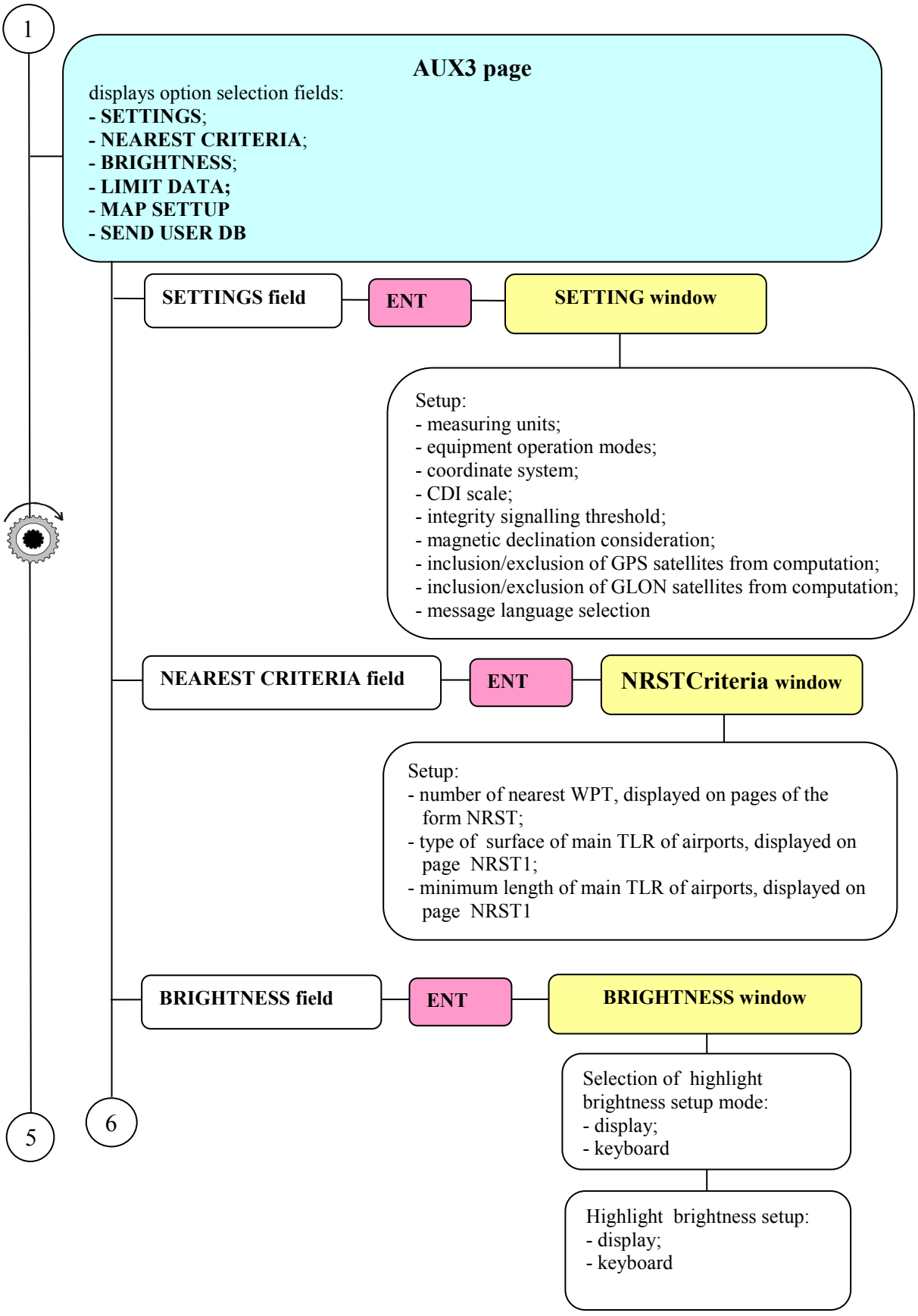


Figure J.1.20 (page 5 of 8)

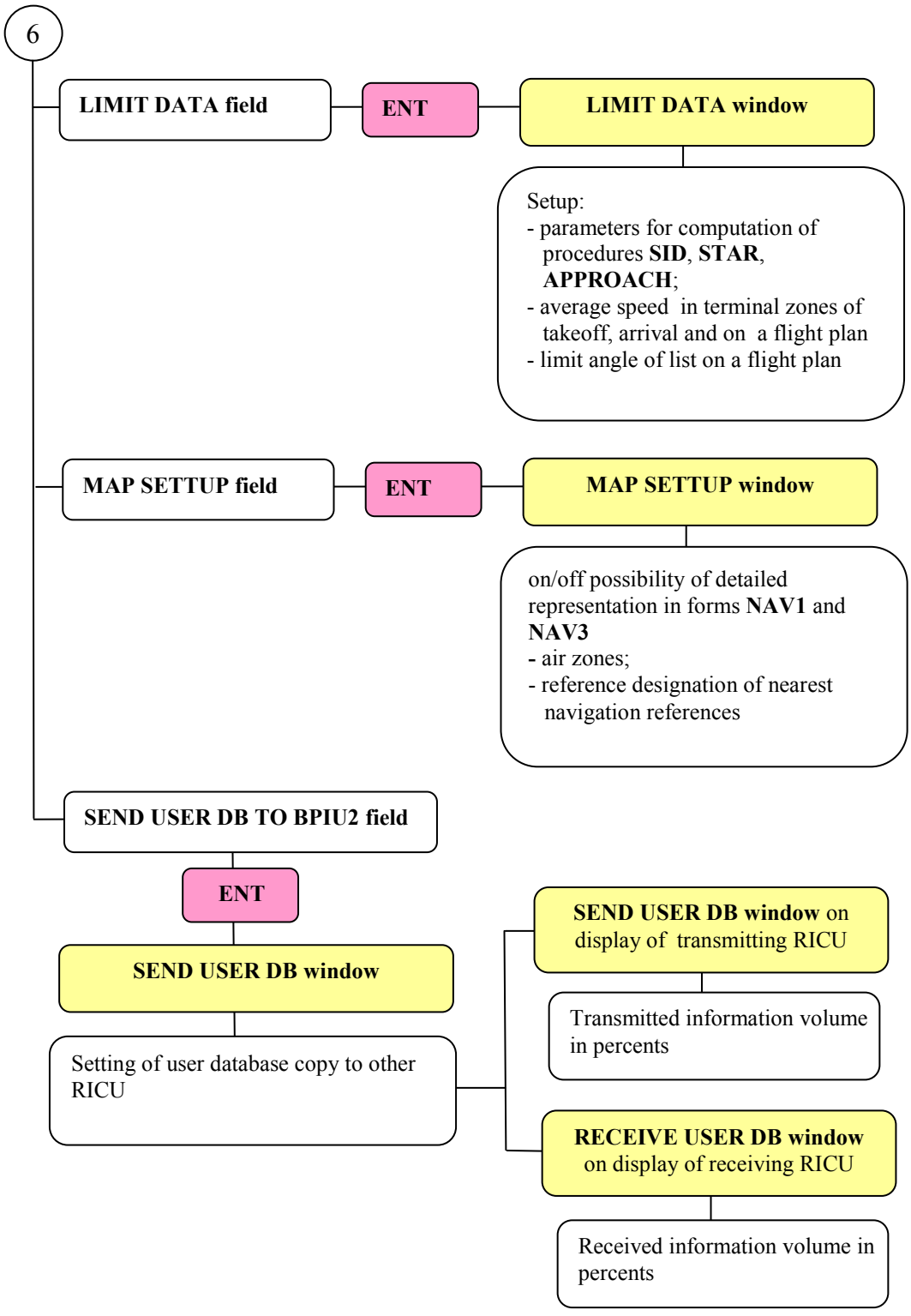

6
LIMIT DATA field
ENT
LIMIT DATA window
Setup:
- parameters for computation of procedures SID, STAR, APPROACH;
- average speed in terminal zones of takeoff, arrival and on a flight plan
- limit angle of list on a flight plan
MAP SETTUP field
ENT
MAP SETTUP window
on/off possibility of detailed representation in forms NAV1 and NAV3
- air zones;
- reference designation of nearest navigation references
SEND USER DB TO BPIU2 field
ENT
SEND USER DB window
Setting of user database copy to other RICU
SEND USER DB window on display of transmitting RICU
Transmitted information volume in percents
RECEIVE USER DB window on display of receiving RICU
Received information volume in percents

Figure J.1.20 (page 6 of 8)

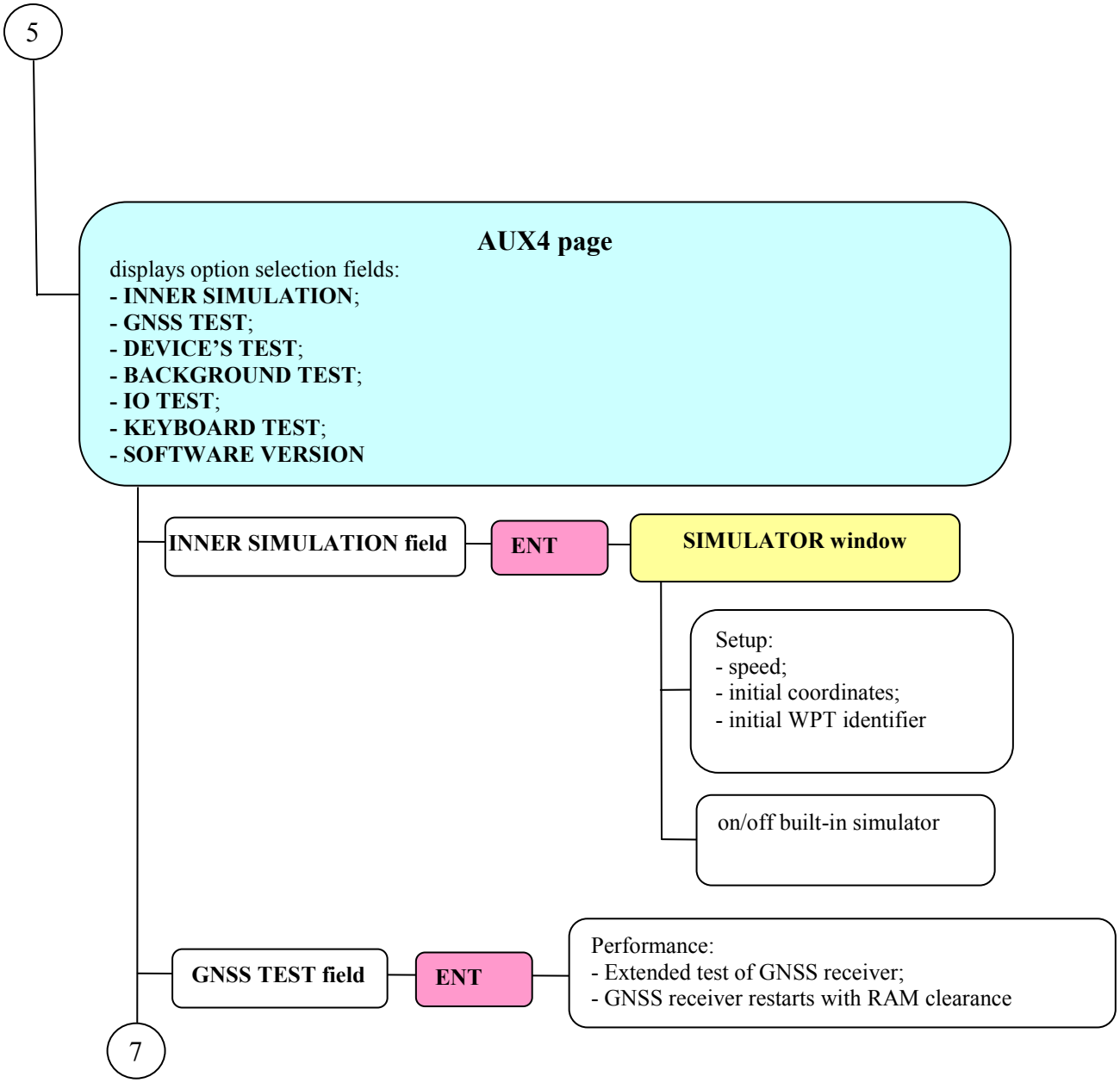


Figure J.1.20 (page 7 of 8)

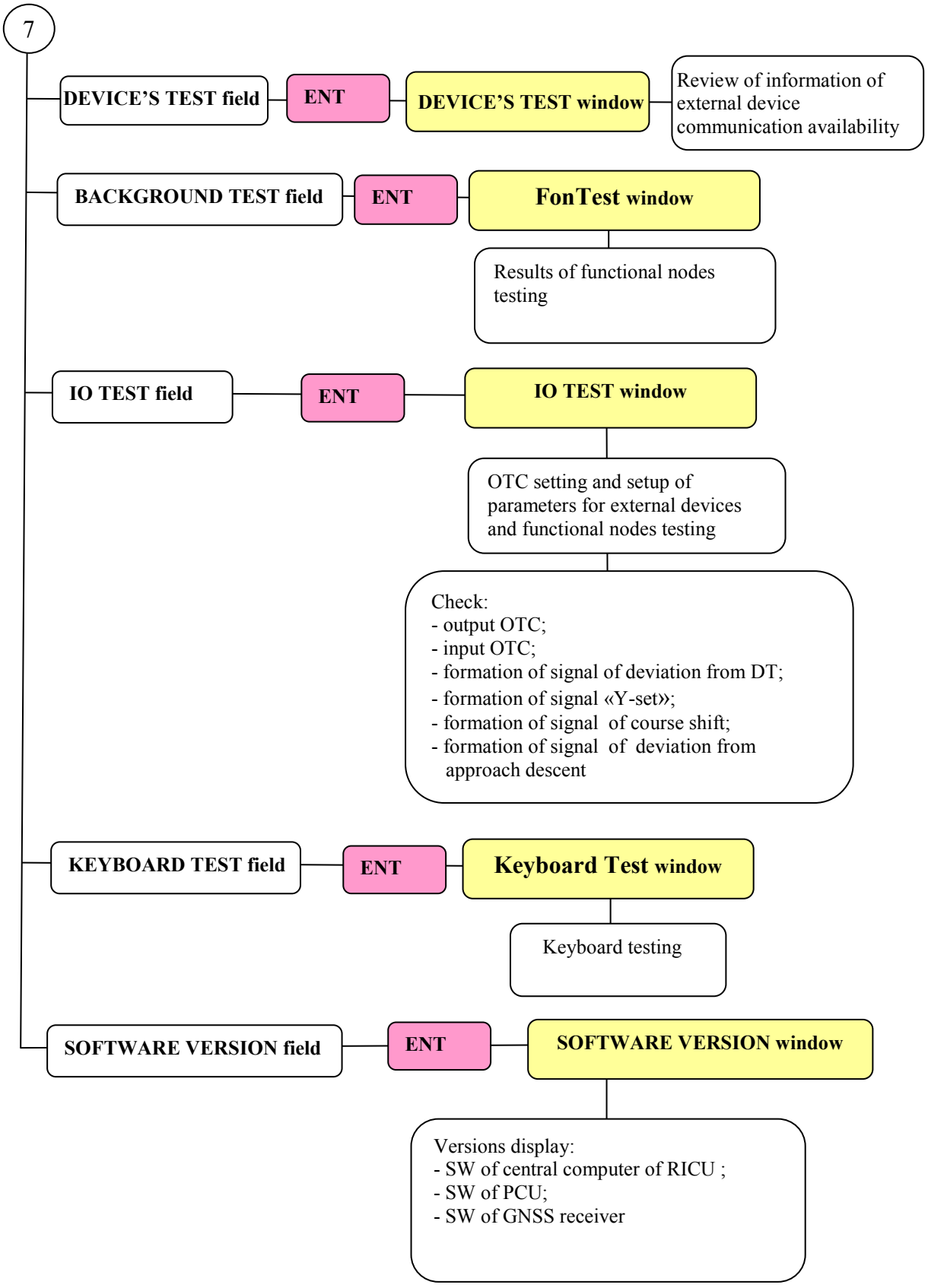


Figure J.1.20 (page 8 of 8)

Logical tree of PROC form

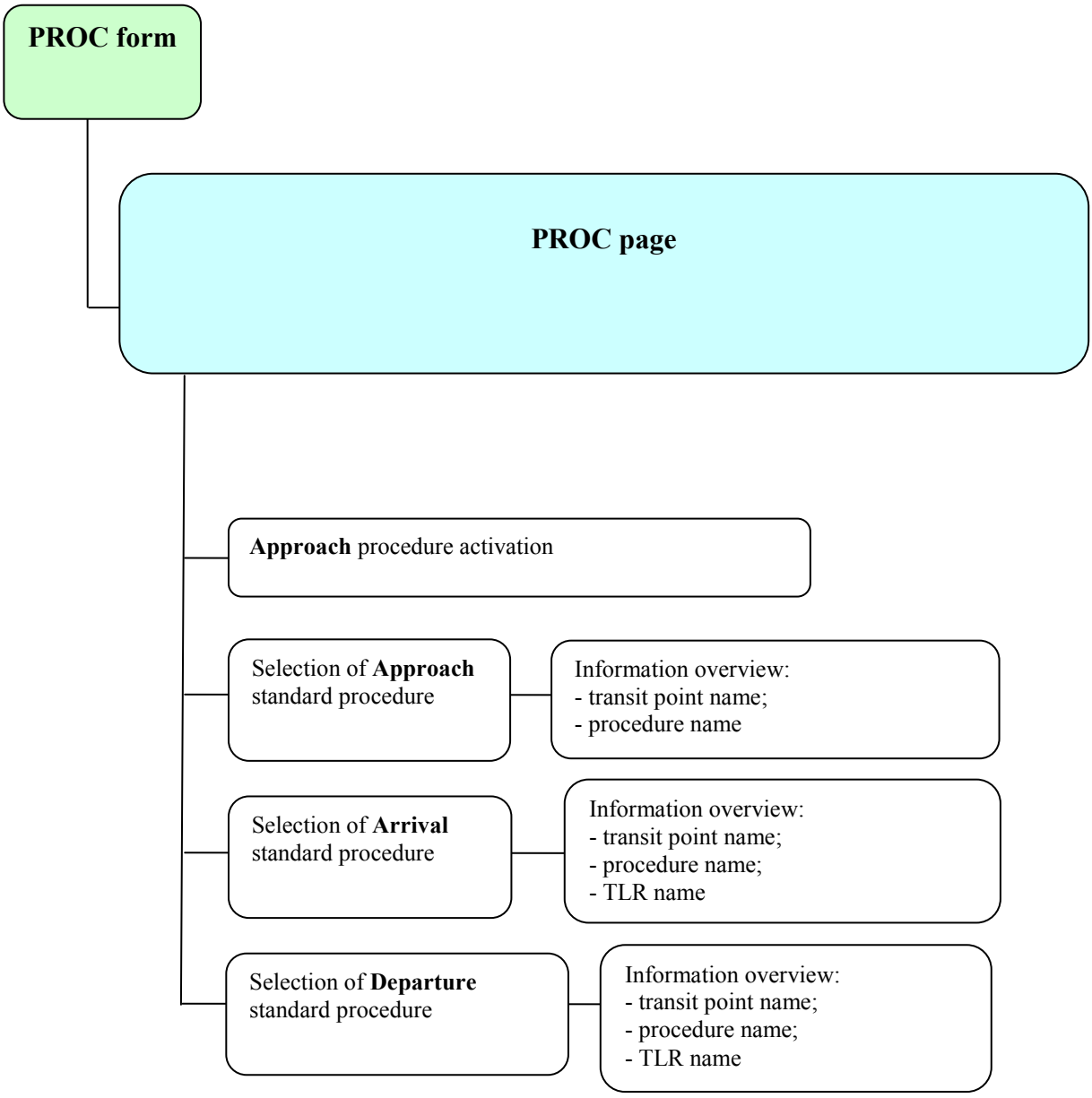


Figure J.1.21

J.2 Operation description in NAV form

Navigation form is intended for display of main navigation parameters and for graphic representation of a flight plan and navigation references (airports and beacons).

The **NAV** form contains five pages:

a) **NAV1** page is used for display of:

- navigation parameters;
- graphic representation of a flight plan;

b) **NAV2** page is used for display of:

- navigation parameters;
- current coordinates;
- altitude;
- UTC time and date;

c) **NAV3** page is used for display of graphic representation of a flight plan;

d) **NAV4** page is used for display of frequency information of radio communication equipment of the nearest airport;

e) **NAV5** page is used for display:

- deviation (orthodromic) from RW center line;
- distance (orthodromic) from RW threshold;
- bearing to RW threshold from the current position of aircraft;
- distance to RW threshold from the current position of aircraft;
- graphic representation of selected RW of landing airport;
- information about selected RW of landing airport.

Entry in **NAV** form is accomplished:

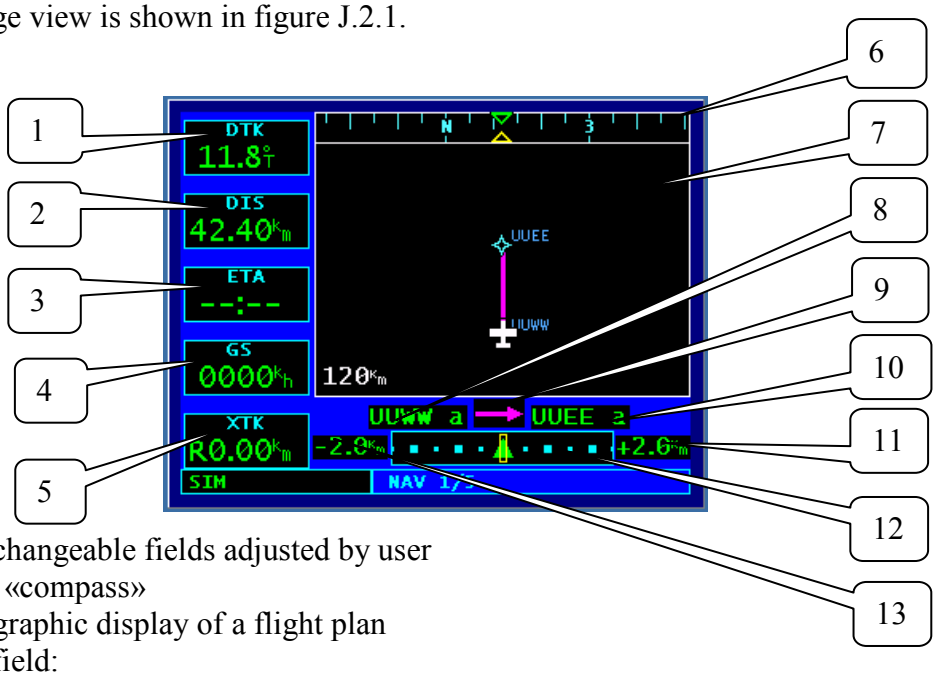
- automatically after power-up;
- after pressing **NAV** button on RICU;
- automatically after flight setting in **DIRECT ON** mode.

When entering **NAV** form**, NAV1** page is always displayed on RICU. Switching of **NAV** form pages is executed by rotating an internal knob.

NAV1 page

NAV1 page is used for display of information, which is necessary for AC control when moving according to a flight plan.

NAV1 page view is shown in figure J.2.1.



1 – 5 Interchangeable fields adjusted by user
6 Scale of «compass»
7 Field of graphic display of a flight plan
8 Display field:
- identifier of previous WP;
- symbols -----, when executing flights in **DIRECT TO** mode;
- specified transit angle of target point when executing flight in **OBS** mode

9 Filed of display of maneuver type :
- → flight to a target point by route way;
- D→ flight in **DIRECT TO** mode;
- C→ flight with achieving the point with specified course angle;
- ↺ flight along the arc with fixed radius of a turn, left turn;
- ↻ flight along the arc with fixed radius of a turn, right turn

10 Field of display of target point identifier
11, 13 Range of scale of deviation from DT
12 Scale of deviation from DT

Figure J.2.1

Figure J.2.1 shows factory setting of parameters, displayed in interchangeable fields. List of parameters, which can be displayed in interchangeable fields 1-5, is stated in table J.2.1.

Table J.2.1

Designation in form	Parameter
ATD	Distance to TPon DT (Sleft)
BRG	Bearing to target point
DIS	Distance to target point
CUM	Total distance to flight destination point on desired track
DTK	Desired course angle
ETA	Target point arrival time
ETE	Flight time left to target point
GS	Ground speed
TKE	Turn angle (difference between desired track angle and current track angle)
TRK	Actual course angle
XTK	Cross Track Distance/Deviation
Empty	Reserved line

«Compass» scale description

Fixed indicator of actual track angle is located in the upper part of "compass" scale; movable indicator of desired track angle is located in the lower part.

Range of scale displayed – 60 degrees.

Division value of "compass" scale is 5 degrees.

Digital values of calibration in 30 degrees (without last zero in digital value) are stated on "compass" scale. World parts are marked with respective symbols.

Description of scale of deviation from DT

Scale of deviation from DT (scale CDI) has:

- ten divisions;
- motionless symbol of AC «▲» (when executing flight to the point) or "▼" (when executing flight from the point) in the middle of DT scale;
- movable symbol of DT «▌».

Scale of deviation from DT is intended for graphic display of AC position and desired track. Display principle "from aircraft to earth" is accepted in equipment, that is, AC symbol is motionless and displayed in the centre of the scale, and symbol of desired track moves relatively to AC symbol.

If AC deviation from DT is to the left, symbol of desired track moves in display to the right and vice versa. When DT leaves the limits of the scale, deviation from DT in digital form and direction necessary to reach DT is displayed.

Measure of scale of deviation from DT is changed automatically depending on flight stage.

It is possible to set scale of deviation from DT manually (page **AUX3** field **SETTINGS**).

Range of desired track deviation is set automatically, depending on the flight stage:

from -10 to +10 km (from -5 to +5 NM) en route;

from -2 to +2 km (from -1 to +1 NM) when flight at airport area;

from -0,5 to +0,5 km (from -0,3 to +0,3 NM) 2 miles before aircraft FAWP fly-over in APPROACH procedure.

Five divisions of scale of deviation from DT to the right from the centre and five divisions to the left from mark the corridor. Width of the corridor displayed is defined by measure of scale of deviation from DT.

When AC goes out of the limits of the corridor, equipment generates warning message.

Switching on/off display of navigation references and/or air zones in field of graphic representation of a flight plan.

To switch on/off display of navigation parameters and/or air zones in field of graphic representation of a flight plan, press **CLR** button.

Only those navigation references and air zones are displayed in field of graphic representation of a flight plan, which are selected in **MAP SETTUP** window (figure J.8.72) of **AUX3** page.

With serial pressing **CLR** button, RICU display sequentially in a circle indicates in field of graphic representation of a flight plan together with a flight plan:

- nearest navigation references (figure J.2.2);
- nearest navigation references and air zones (figure J.2.3);
- air zones (figure J.2.4);
- indication of navigation zones and nearest navigation references is unavailable (figure J.2.1).

Figure J.2.2

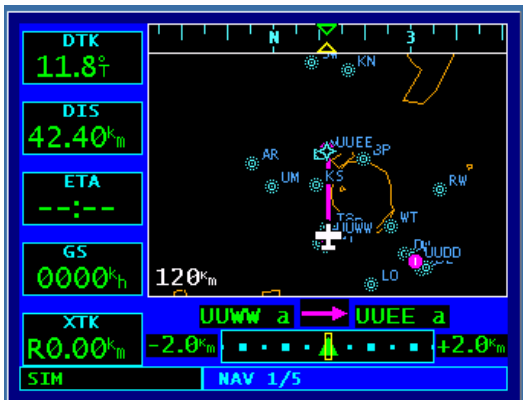


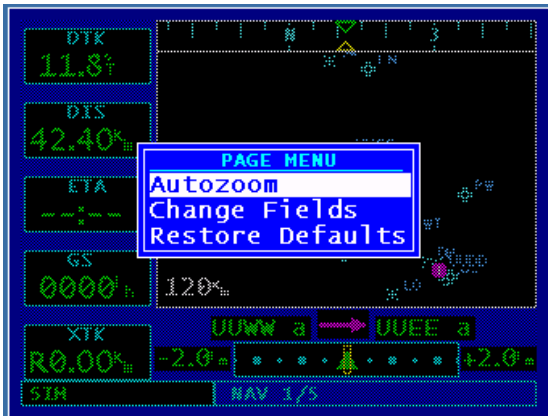
Figure J.2.3

Figure J.2.4

Functions performed on NAV1 page by pressing MENU button

When pressing **MENU** button, **PAGE MENU** pop-up window is displayed on **NAV1** page (figure J.2.5), its fields are intended for fulfilling the following operations:

- of automatic scale change of flight plan graphic representation (**Autozoom** field);
- interchangeable fields setting (**Change Fields** field);
- interchangeable fields setting in accordance with factory setting (**Restore Defaults** field).



Activation of automatic scale change of flight plan graphic representation

Change of flight plan graphic representation can be accomplished manually (by means of the button **RNG+** and **RNG-**) or in automatic mode. To activate automatic scale change:

а) set highlight to **Autozoom** field in **PAGE MENU** pop-up window (figure J.2.5);

б) press ENT, **PAGE MENU** pop-up window will stop being displayed on **NAV1** page. Automatic scale change will switch on. A scale, with which an active flight plan leg is displayed in the field of flight plan graphic representation, should be set automatically.

Deactivation of automatic scale change is executed by pressing the button **RNG+** or **RNG-** button.

Note – *Scale means ratio of the ground distance to pictorial route field altitude (pos.7 Figure J.2.1). Scale 120$^{K}_{m}$ on figure J.2.1 means that pictorial route field altitude corresponds to 120 km on the ground.*

Interchangeable fields change

To set interchangeable fields:

a) set highlight to **Change Fields** field in **PAGE MENU** pop-up window (figure J.2.5);

b) press **ENT**. **PAGE MENU** pop-up window will stop being displayed on **NAV1** page. Mnemonic symbol of one of interchangeable fields will highlight (figure J.2.6);

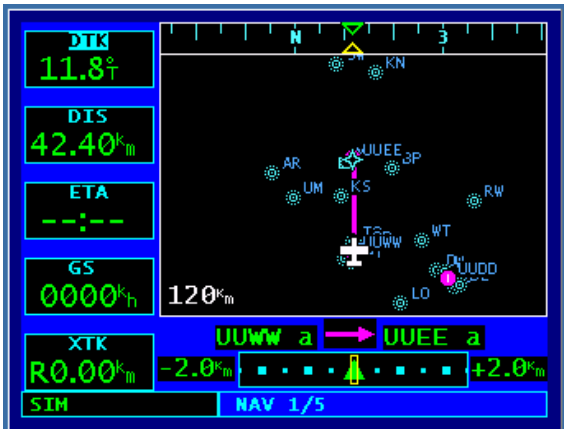


Figure J.2.6

c) set the highlighting to mnemonic symbol of the parameter, which must be changed

d) rotate internal knob for one position. **SELECT FIELD TYPE** window is displayed on **NAV1** page (figure J.2.7);

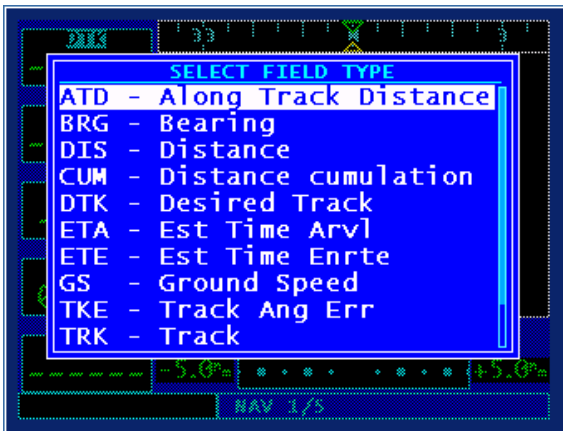


Figure J.2.7

e) set the highlighting in **SELECT FIELD TYPE** window to the required parameter;

f) press ENT to confirm the change by necessary parameter, **SELECT FIELD TYPE** window will stop being displayed on **NAV1** page. The required parameter is displayed in a selected interchangeable field, mnemonic symbol of the parameter of one of interchangeable fields is highlighted;

g) do all necessary changes of interchangeable fields similarly;

h) press **CLR** or **CRSR** button for exit out of the mode of interchangeable fields change. Highlight of an interchangeable field will disappear.

Setup of interchangeable fields in accordance with factor Y required up

For setup of interchangeable fields in accordance with factor Y required up:

a) set the highlighting in **Restore Defaults** field of **PAGE MENU** pop-up window (figure J.2.5);

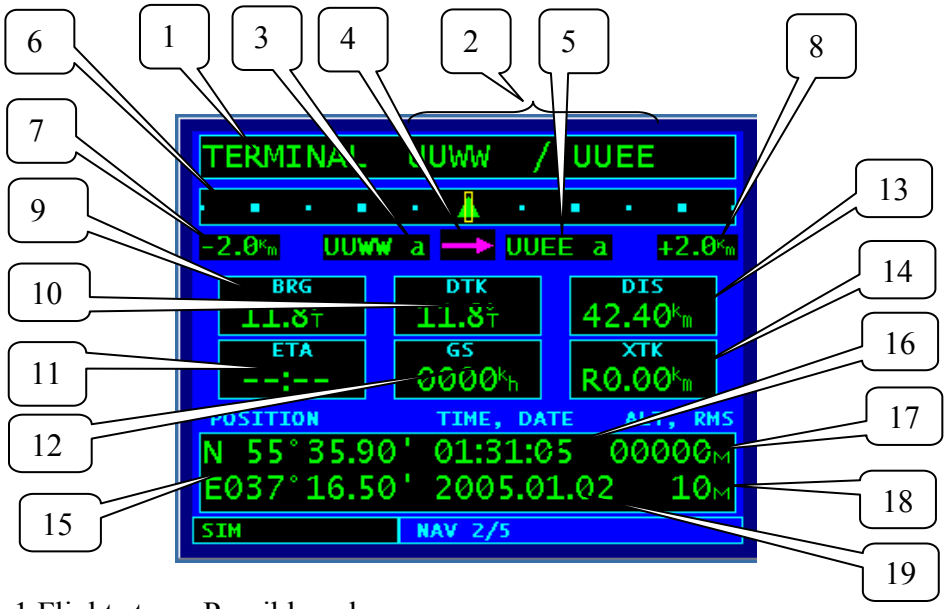
b) press **ENT**;

c) **PAGE MENU** pop-up window will stop being displayed on **NAV1** page. Interchangeable fields in accordance with factor Y required up will be displayed on the **NAV1** page.

NAV2 page

NAV2 page is used to display navigation parameters.

View of **NAV2** page is shown in figure J.2.8.



1 Flight stage. Possible values:
- **ENROUTE** – route;
- **TERMINAL** – airport area;
- **APPROACH** – approach landing

2 Name of the route

3 Display field of:
- previous WP identifier;
- symbols -----, with flight in modes **DIRECT TO and VTF**;
- desired flight angle of target point at flight performance in **OBS** mode

4 Display field of type of maneuver being accomplished:
- → flight to target point in a route way;
- D→ flight in mode **DIRECT TO**;
- C→ flight with achieving the point with specified course angle;
- **VTF** flight in mode **VTF**;
- ↺ flight along the arc with fixed radius of a turn, left turn;
- ↻ flight along the arc with fixed radius of a turn, right turn

5 Field of display of target point identifier

6 Scale of deviation from DT (described on **NAV1** page)

7, 8 Range of DT scale

9-14 Interchangeable fields, adjustable by the user

15 Current coordinates

16 Time (hours, minutes, seconds)

17 Altitude over geoid

18 Coordinates determination accuracy

19 Date (year, month, date)

Figure J.2.8

Figure J.2.8 demonstrates factory requiredup of parameters, displayed in interchangeable fields. List of parameters, which can be displayed in interchangeable fields 9-14 is shown in table J.2.1.

Operations being accomplished on NAV2 page with MENU button

On **NAV2** page by pressing **MENU, PAGE MENU** pop-up window is displayed (figure J.2.9), its fields are used to accomplish the following operations:

- setup of interchangeable fields (**Change Fields** field);
- adjustment of interchangeable fields in accordance with factory setting (**Restore Defaults** field**).**

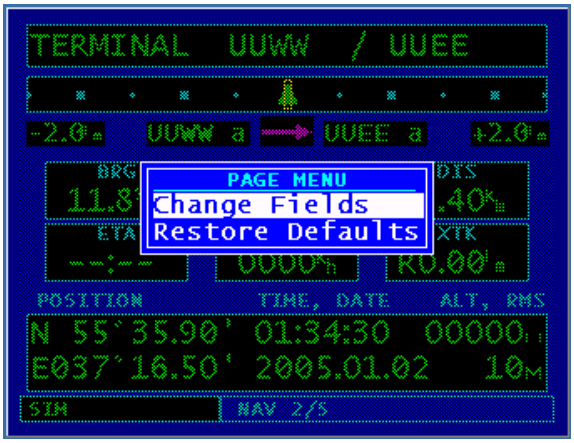


Figure J.2.9

Adjustment of interchangeable fields

Adjustment of interchangeable fields on **NAV2** page is effected analogically with adjustment of interchangeable fields, stated when describing **NAV1** page.

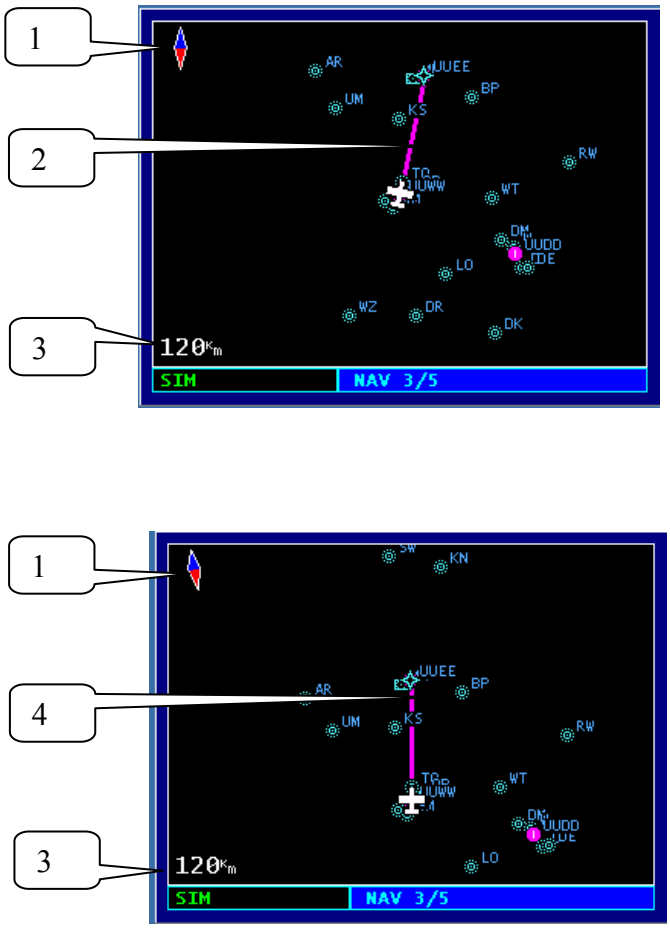
Adjustment of interchangeable fields in accordance with factory setting

Adjustment of interchangeable fields on **NAV2** page is effected analogically with adjustment of interchangeable fields, stated when describing **NAV1** page.

NAV3 page

NAV3 page is used for graphic display of a flight plan.

View of **NAV3** page is shown in figure J.2.10.



1 Pointer of direction to north
2 Graphic display of a flight plan, oriented by direction to north
3 Scale of flight plan display
4 Graphic display of a flight plan, oriented by course angle

Figure J.2.10

Activation/deactivation of display of navigation references and/or air zones

Activation/deactivation of display of navigation references and/or air zones is effected by analogy with those stated in **NAV1** page.

Operations being accomplished on the page NAV3 by the button MENU

On **NAV3** page by pressing **MENU** button**, PAGE MENU** pop-up window is displayed (figure J.2.11), its fields are used to accomplish the following operations:

- setup of route orientation to north (**True Nord** field);
- setup of route orientation by course angle (**DTK** field);
- activation of automatic zoom (**Autozoom** field);
- flight plan overview (**View Route** field).

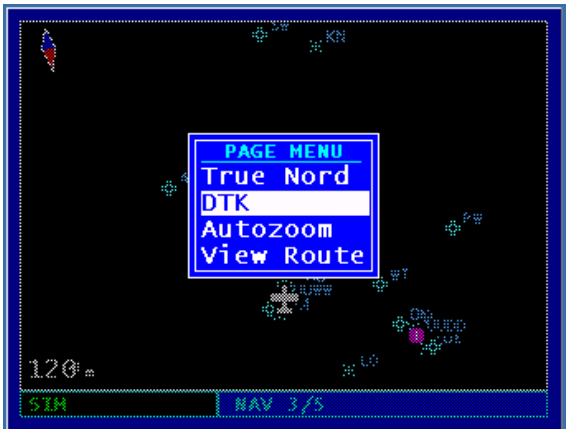


Figure J.2.11

Setup of route orientation

To setup route orientation:

а) set the highlighting in **PAGE MENU** pop-up window (figure J.2.11) to:

- **True Nord** if it is required to get graphic display of a flight plan oriented to north on RICU;
- **DTK** if it is required to get graphic display of a flight plan oriented by course angle on RICU;

б) press **ENT**.

Activation of automatic zoom

Activation of automatic zoom is effected by analogy with activation of automatic zoom, described in **NAV1** page.

Flight plan overview

To view a flight plan:

a) set the highlighting to **View Route** field in **PAGE MENU** pop-up window (figure J.2.11);

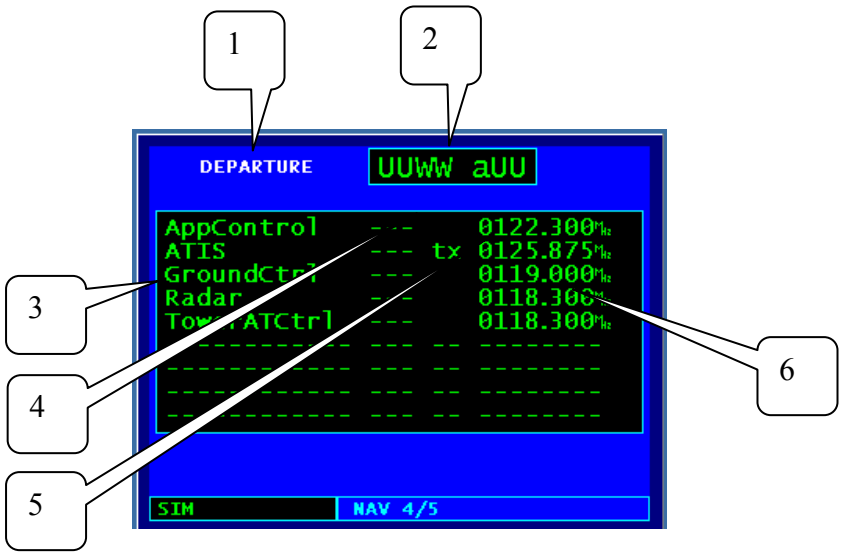
b) press **ENT**. Symbol «+» will appear in the centre of display, this symbol indicates flight plan overview;

c) flight plan overview is accomplished by rotating internal and external knob of the handle. Graphic display of a flight plan is moved vertically by rotating internal knob, Graphic display of a flight plan is moved horizontally by rotating external knob. To zoom image, use **RNG+**, **RNG-**buttons.

NAV4 page

NAV4 page is intended to display information about operating frequences of airport communication equipment.

Overview of **NAV4** page is shown in figure J.2.12.



1 Flight stage symbols:
- **DEPARTURE** - departure;
- **ENROUTE** - route;
- **ARRIVAL** - arrival

2 Identifier of airport concerned with communication equipment
3 List of radio communication equipment of an airport
4 Service-indicator
5 Operating mode of radiocommunication equipment:
- rx - receiver;
- tx – transmitter;
- «--» - not defined in database

6 Frequency

Figure J.2.12

List of radiocommunication equipment, which an airport can have, is stated in table J.2.2. Values which service-indicator can take on, are shown in table J.2.3.

Table J.2.2

Symbol in ARINC-424	Symbol in the form	Radiocommunication equipment	Description	Airport and heliports connection	Connection on the route	Both types of communication
ACC	ArCntrCenter	Area Control Center	Regional centre ATC			X
ACP	AliftComPost	Airlift Command Post	Command Post	X		
APP	AppControl	Approach Control	Approach Control	X		
ARR	ArrControl	Arrival Control	Arrival Control	X		
ATI	ATIS	Automatic Terminal Info Service (ATIS)	Automatic Terminal Information Service	X		
AWO	AWOS	Automatic Weather Observing Service (AWOS)	Automatic Weather Observing Service	X		
CLD	CleaDelivery	Clearance Delivery	Air traffic clearance delivery	X		
CPT	CleaPre-Taxi	Clearance, Pre-Taxi	Air traffic clearance, pre-taxi	X		
CTA	ControlArea	Control Area (Terminal)	Control Area (Terminal)	X		
CTL	Control	Control	Control			X
DEP	DeparControl	Departure Control	Departure Control	X		
DIR	Director	Director (Approach Control Radar)	Director (Approach Control Radar)	X		
EMR	Emergency	Emergency	Emergency			X
FSS	FlgServStat	Flight Service Station	Flight Service Station			X
GND	Ground Ctrl	Ground Control	Ground Control	X		
GTE	Gate Control	Gate Control	Gate Control	X		
HEL	HelicopFreq	Helicopter Frequency	Helicopter Frequency	X		

Continuation of Table J.2.2

Symbol in ARINC-424	Symbol in the form	Radiocommunication equipment	Description	Airport and heliports connection	Connection on the route	Both types of communication
INF	Information	Information	Information			X
MUL	Multicom	Multicom	Multicom			X
OPS	Operations	Operations	Operations	X		
RDO	Radio	Radio	Radio			X
RDR	Radar	Radar	Radar			X
RFS	RFSS	Remote Flight Service Station (RFSS)	Remote Flight Service Station			X
RMP	RampTaxiCntr	Ramp/Taxi Control	Ramp/Taxi Control	X		
RSA	ARSA	Airport Radar Service Area (ARSA)	Airport Radar Service Area (ARSA)	X		
TCA	TCA	Terminal Control Area (TCA)	Terminal Control Area	X		
TMA	TMA	Terminal Control Area (TMA)	Terminal Control Area	X		
TML	Terminal	Terminal	Terminal	X		
TRS	TRSA	Terminal Radar Service Area (TRSA)	Terminal Radar Service Area	X		
TWE	TWEB	Transcriber Weather Broadcast (TWEB)	Transcriber Weather Broadcast		X	
TWR	TowerATCtrl	Tower, Air Traffic Control	Tower, Air Traffic Control	X		
UAC	UpAreaCtrl	Upper Area Control	Upper Area Control		X	
UNI	Unicom	Unicom	Unicom	X		
VOL	Volmet	Volmet	Volmet		X	
Note – *Availability of respective communication type for radiocommunication equipment of airport is marked by symbol «X»*						

Table J.2.3

Designation	Description	Service-indicator value		
		1	2	3
Aeronautical Enroute Information Service (AEIS)	Aeronautical Enroute Information Service (AEIS)	A	-	-
Enroute Flight Advisory Service (EFAS)	Enroute Flight Advisory Service (EFAS)	E	-	-
Flight Information Service (FIS)	Flight Information Service (FIS)	F	-	-
Air/Ground	Air/Ground	-	A	-
Discrete Frequency	Discrete Frequency	-	D	-
Air/Air	Air/Air	-	C	-
Mandatory Frequency	Mandatory Frequency	-	M	-
Secondary Frequency	Secondary Frequency	-	S	-
VHF Direction Finding Service (VDF)	VHF Direction Finding Service (VDF)	-	-	D
Remote Communications Air to Ground (RCAG)	Remote Communications Air to Ground (RCAG)	-	-	G
Language other than English	Language other than English	-	-	L
Military Use Frequency	Military Use Frequency	-	-	M
Remote Communications Outlet (RCO)	Remote Communications Outlet (RCO)	-	-	R

Overview of radio communication equipment of airport

To overview information about radio communication equipment of airport:

a) press the **CRSR** button, identifier of airport will be displayed;

b) rotate internal knob of the handle one position further. **AIRPORT** pop-up window will be displayed on **NAV4** page, in accordance with figure J.2.13, in which identifiers of initial WP, final WP and two nearest airports are displayed. In case if there is no active flight plan, identifiers of four nearest airports are displayed;

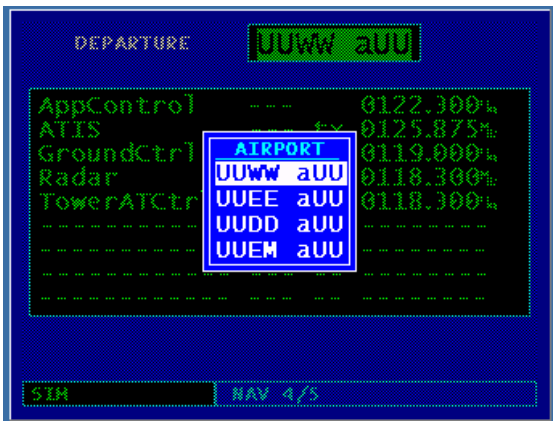


Figure J.2.13

c) set highlight to identifier of airport which information about radiocommunication equipment it is necessary to overview;

d) press **ENT**;

e) information about radiocommunication equipment of selected airport is displayed on **NAV4** page.

NAV5 page

NAV5 page is intended for selection of landing airport and RW of landing airport to review values of deviation from RW center line, distance to RW threshold, bearing to RW threshold and distance to RW threshold from the current position of aircraft, and also for display of information about selected RW of landing airport.

View of **NAV5** page is shown in figure J.2.14.

1 Landing airport
2 RW of landing
3 Pointer of direction to north
4 Graphic display of selected RW of landing airport
5 Scale
6 Command of landing airport and RW selection
7 Deviation (orthodromic) of AC from RW center line («+» - to the right, «-» - to the left)
8 Distance (orthodromic) to RW threshold («+» - flight to RW, «-»- flight from RW)
9 Bearing to RW threshold from the current position of aircraft;
10 Distance to RW threshold from the current position of aircraft;

Note – *If parameter value, pos. 7, 8, is less than 1 km, parameter value is indicated in meters irrespective of required measurement system (metric or English). Resolution of parameter indication at the value to 999 m is 1 m.*

Figure J.2.14

If scale is not more than 15 miles inclusive, RW is displayed in the form of pointer, which wide end defines the end of RW.

If scale is more than 15 miles, airport symbol is displayed instead of RW.

Overview of values of deviation from RW axis, distance to RW end

For overview of values of deviation from RW axis, distance to RW end:

a) set highlight to command of landing airport and RW selection (figure J.2.14);

b) press **ENT**. Window **SELECT ARP AND RW** is displayed on RICU display (figure J.2.15);

1 Landing airport identifier;
2 RW identifier
3 Landing airport coordinates
4 RW course
5 RW length
6 Command of confirmation of landing airport and RW selection

Figure J.2.15

c) turn internal knob one position to the right or left. Page **WPT1** is displayed on RICU display (figure 2.16);

Figure 2.16

d) set highlight to display field of airport identifier. Input landing airport identifier. Press ENT. Highlight will move to **Done?** field;

e) press ENT. **SELECT ARP AND RW** window**,** in which the field of airport RW identifier is highlighted, is displayed on RICU display;

f) turn internal knob one position to the right or left. Page **WPT2** is displayed on RICU display (figure 2.17);

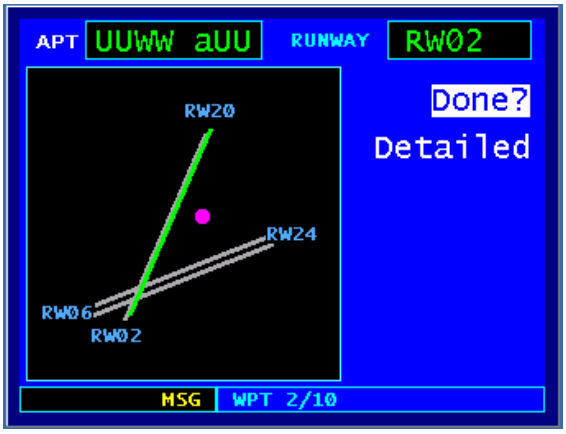


Figure 2.17

g) set the highlighting to display field of airport identifier. Select necessary landing airport RW. Press ENT. Highlighting will move to **Done?** field;

Note – *If it is required to overview parameters of selected RW, set the highlighting to* ***Detailed*** *field and press ENT.* ***RUNWAIT DETAILED*** *window is displayed on RICU display. To quit* ***RUNWAIT DETAILED*** *window, press* ***CLR*** *or* ***CLRS*** *button.*

h) press ENT. **SELECT ARP AND RW** window**,** in which information about selected landing airport RW is shown, is displayed on RICU display,. Field of the command of confirmation of landing airport and RW selection;

i) press ENT. **NAV5** window**,** in which values of deviation from RW axis and distance to RW end, and graphic representation of selected RW of landing airport are displayed, is displayed on RICU display.

Operations, performed on NAV5 page when pressing MENU button

PAGE MENU pop-up window (figure J.2.18), which fields are used to perform the following operations:

- setup of RW orientation to north (**True Nord** field);
- setup of RW orientation by course angle (**DTK** field),
- scale automatic change activation (**Autozoom** field);
- route view (**View Route** field)

is displayed on **NAV5** page by pressing **MENU** button.

Note - *Viet Route fields are not used*.

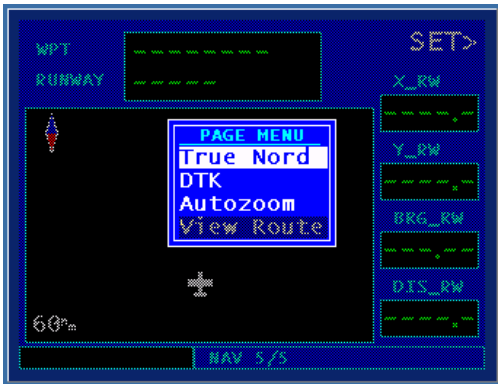


Figure J.2.18

Setup of RW orientation

For setup of RW orientation:

a) in **PAGE MENU** pop-up window (figure J.2.18) set the highlighting to the field:

-**True North** if it is required to obtain graphic display of RW, oriented to north, on RICU display;

- **DTK** if it is required to obtain graphic display of RW, oriented by course angle, on RICU display;

b) press **ENT**.

Scale automatic change activation

The scale automatic change is activated in similarly to the scale automatic change activation, as described on **NAV1** page.

J.3 Operation description in FPL form

FPL form is used to work with flight plans created by users.

The form contains two pages:

- page of detailed overview of active flight plan **FPL1** (**Active Flight Plan**);
- page of flight plan catalogue **FPL2** (**Flight Plan Catalog**).

To enter **FPL** form one should press **FPL** buttons on RICU. In case of repeated pressing the **FPL** button, the form, which was on RICU display prior to activation of the form **FPL** form**,** is displayed on RICU display. When entering the form **FPL** form**, FPL1** page is always displayed on RICU display. Page switching of **FPL** form is performed by rotating internal knob of the handle.

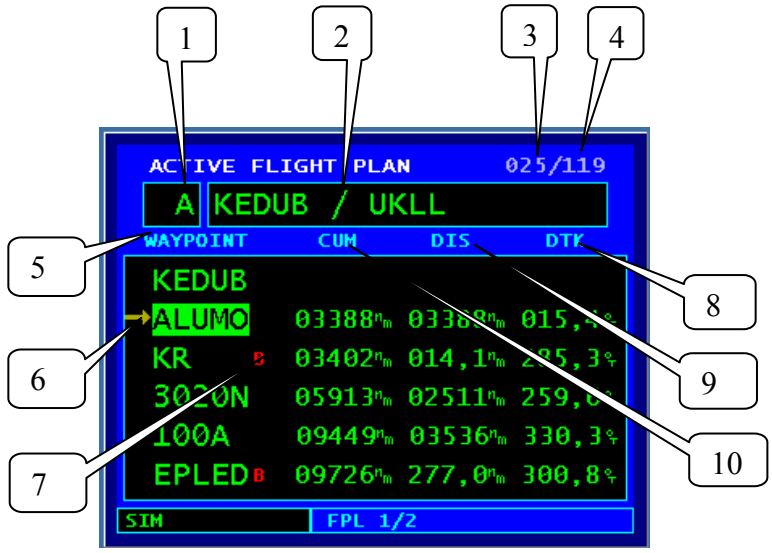
Creation and editing of a flight plan is accomplished on **FPL1** or **FPL2** page.

Flight plan created on **FPL1** page is stored in RICU memory until it is deleted, or until activation of another flight plan is done.

SID, **STAR**, **APPROACH** procedures can be included only in active flight plan.

FPL1 page

View of **FPL1** page (Active Flight Plan) with active flight plan is shown in figure 3.1.



1 Sign of an active flight plan
2 Field of flight plan name can be displayed:
- identifier of initial WP / identifier of final WP;
- identifier of initial WP / identifier of final WP (rev) – when executing a reverse flight plan;
- flight plan name input by operator;
- D▸ and target point identifier, not included in an active flight plan – when executing a flight in **DIRECT TO** mode (figure J.3.2);
- D▸ and current target point identifier ~ Q ~ TP identifier, standing in the queue - when executing a flight in **DIRECT TO** mode with setting WP in a queue (figure J.3.3)

3 Number of WP in a flight plan
4 Number of WP possible for input in a flight plan
5 WP identifier
6 Field before WP identifier - field of designation of flight plan active step:
- → - flight in **DIRECT TO** mode;
- - flight with reaching WP with desired track angle;
- - flight along the arc with fixed radius of a turn, left turn;
- - flight along the arc with fixed radius of a turn, right turn;
- or - flight to a target point in a route way

7 Reference designation of WP
8, 9, 10 WP parameters in interchangeable fields, adjusted by the user

Figure J.3.1

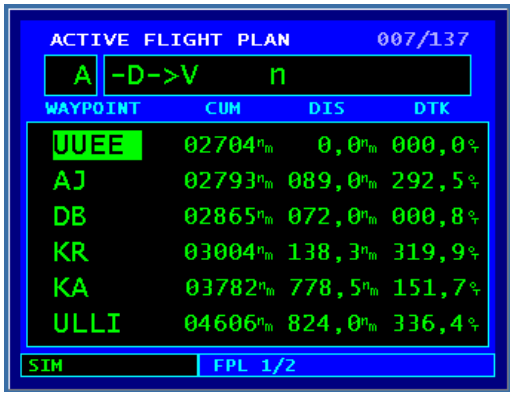


Figure J.3.2

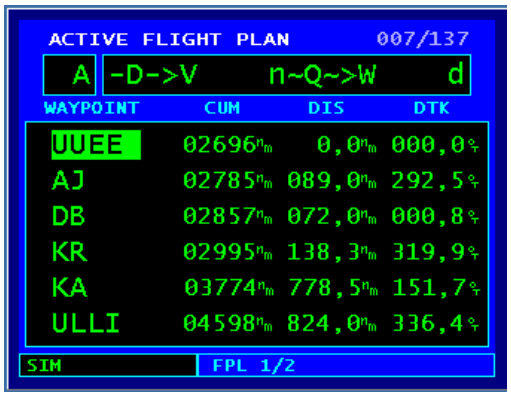


Figure J.3.3

Figure J.3.1 shows factory setting of parameters, displayed interchangeable fields. List of parameters which can be displayed n interchangeable fields 8-10, is shown in table J.3.1. List of possible reference designations of WP is shown in table J.3.2.

Table J.3.1

Designation in the form	Parameter	Interchangeable field
CUM	Total distance to flight destination point on desired track	pos.8-10
DIS	Length of flight plan leg along DT	pos.8-10
DTK	Desired track angle	pos.8-10
ETA	Time of arrival to WP	pos.8-10
ETE	Flight time left to reach WP	pos.8-10
ESA	Safe flight altitude in a flight plan	pos.8
ARP	Airport identification code	поз.8-10

Table J.3.2

Reference designation of WP	Parameter	Description
a..	ABSENT	Point was not found during check of flight plan points
.b.	BAD	Error is registered for a point (for example, point coordinates failed to be loaded)
D..	Direct	Mode **DIRECT TO** is set for a point
J..	Turn	Target point of a left arc
R..	Turn	Target point of a right arc
C..	PathBeg	Target point of step CF (CourseFix)
B..	Report	Point of report about passing
.I.	IAF	Control point of initial stage of approach
.M.	MAP	Point of moving to a second circle
.F.	FAF	Control point of final stage of approach
..O	FlyOver	Visited point
..L	LoopBeg	Point of waiting zone start
..S	Loop	Point of exit from waiting zone
..C	CrsFix	Point of course fixation
..M	MissAppr	Last point of a flight plan, further subroute of interrupted approach
Empty field		No reference designation
Note - *Symbol «·» indicates decade in reference designation of WP*		

View of **FPL1** page in case of absence of an active flight plan is shown in figure J.3.4.

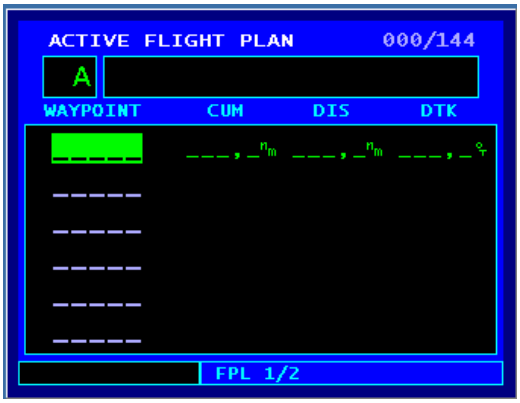


Figure J.3.4

Active flight plan editing

Active flight plan editing means execution of the following operations:

- deletion of WP form a flight plan;
- input of a new WP into a flight plan;
- input of a leg of standard lane into a flight plan;
- input and deletion of standard **SID**, **STAR**, **APPROACH** procedures (by pressing **MENU** button).

WARNING

1 AFTER EACH ACTIVE ROUTE THE ACTIVE LEG OF ROUTE SHALL BE CONTROLLED AND THE REQUIRED LEG OF ROUTE SHALL BE ACTIVATED IF NECESSARY.

2 AT SID PROCEDURE ENTERING (REPLACING) IN ACTIVE ROUTE THE REQUIRED LEG OF ROUTE SHALL BE ACTIVATED.

3 AT APPROACH PROCEDURE ENTERING (REPLACING) WITH ACTIVE LAST LEG OF ROUTE THE REQUIRED LEG OF ROUTE SHALL BE ACTIVATED.

4. IN THE CASE OF NECESSITY OF ARRIVAL AND APPROACH PROCEDURES ENTERING IN ROUTE, THESE PROCEDURES SHALL BE ENTERED IN THE SEQUENCE AS FOLLOWS: FIRST ENTER ARRIVAL PROCEDURE, THEN - APPROACH.

WP deletion from an active flight plan

To delete WP from an active flight plan:

a) set highlight to identifier of WP, which should be deleted from a flight plan, on **FPL1** page;

b) press **CLR** button. Pop-up window with the enquiry about confirmation or refusal of deletion of selected WP is displayed on RICU display (figure J.3.5);

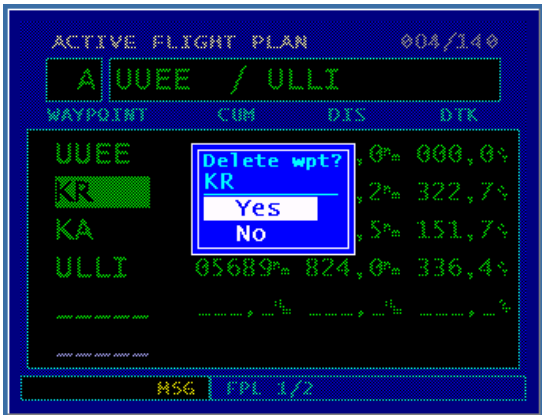


Figure J.3.5

c) press **ENT** to delete selected WP (to refuse deletion, press the button **CLR** or set the highlighting to **NO** field and press **ENT**).

Input of a new WP to an active flight plan

To input a new WP to an active flight plan:

a) set the highlighting on **FPL1** page to identifier of WP, before which a new WP should be input (if it is required to input WP in a flight plan after final WP, set the highlighting on the field, located below identifier of final WP of a flight;

b) turn internal knob one position to the right or left;

c) if standard lanes do not pass through WP which is highlighted, or there is no information about standard lanes, window **fpl_add** is displayed on RICU display (figure J.3.6).

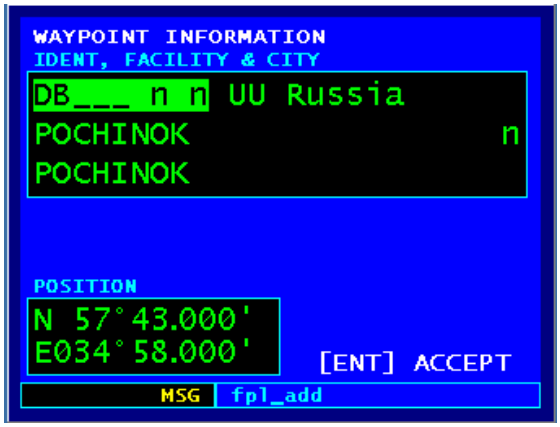


Figure J.3.6

In this case to input WP:

- input identifier of WP, which should be input in a flight plan;
- press ENT. If there are several WP with identifier input, **DUPLICATE WAYPOINTS** pop-up window for selection of a region, where WP with input identifier is located, will appear on RICU display (figure J.3.7);

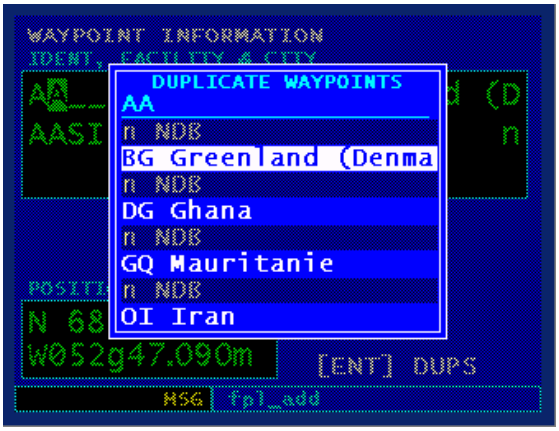


Figure J.3.7

- set the highlighting on the required region of WP and press **ENT**. Page according to figure J.3.8 is displayed on RICU display;

Figure J.3.8

- press **ENT** to confirm input of a new WP. **FPL1** page**,** in which a new WP is included in a flight plan, is displayed on RICU display;

d) if highlighted WP is included at least in one of standard lanes, then **FPL correction** pop-up window is displayed in **FPL1** page (figure J.3.9). Identifiers of standard lanes, which contain WP highlighted, are displayed in **FPL correction** window.

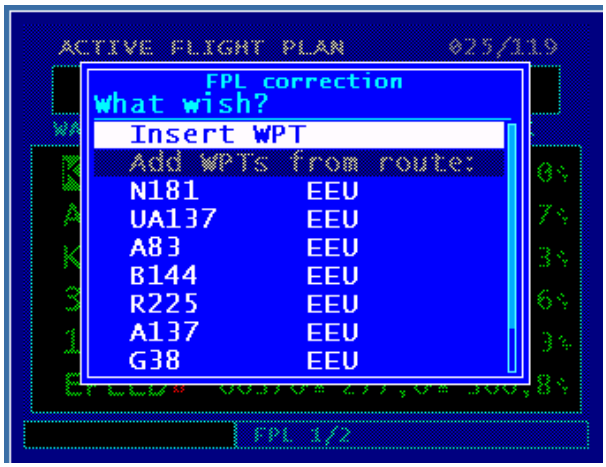


figure J.3.9

In this case to input WP:

- press **ENT** (when **Insert WP** field is highlighted). Window **fpl_add** is displayed on RICU display (figure J.3.6);
- input a new WP in a flight plan in a way described above.

Input of a leg of standard lane in an active flight plan

To input a leg of standard lane in an active flight plan:

a) set highlight on **FPL1** page to identifier of WP, after which a leg of standard lane should be input. WP must be included in at least one of standard lanes;

b) turn internal knob one position to the right or left. **FPL correction** pop-up window is displayed on **FPL1** page (figure J.3.9);

c) set the highlighting to identifier of required standard lane;

d) press **ENT**. Page according to figure J.3.10. is displayed on RICU display. As standard lanes can have signs of approved movement directions, thus all identifiers of WP of standard lane, flight to which is possible from highlighted WP in an active flight plan, will be brightly highlighted;

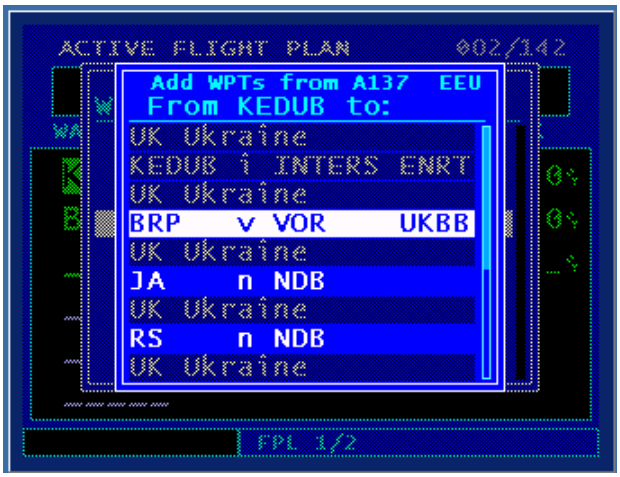


Figure J.3.10

e) set the highlighting on the identifier of required WP, press **ENT**. RICU display shows **FPL1** window with all WP of standard lane included in a flight plan from highlighted one on the **FPL1** to selected WP in pop-up window inclusive.

Operations performed on FPL1 page when pressing MENU button

PAGE MENU pop-up window (figure J.3.11) is displayed on **FPL1** page by pressing **MENU** button, its fields are used to accomplish the following operations:

- flight plan activation (**Activate?** field);
- flight plan leg activation (**Activate Leg?** field);
- retarget to flight plan WP (**Retarget To Point?** field);
- flight plan copy to memory (**Copy Flight Plan?** field);
- flight plan reverse (**Invert Flight Plan?** field);
- flight plan removal (**Delete Flight Plan?** field);
- selection and inclusion of **Approach** procedure to a flight plan (**Select Approach?** field);
- selection and inclusion of **STAR** procedure to a flight plan (**Select Arrival?** field);
- selection and inclusion of **SID** procedure to a flight plan (**Select Departure?** field);
- deletion of **Approach** procedure from a flight plan (**Remove Approach?** field);
- deletion of **STAR** procedure from a flight plan (**Remove Arrival?** field);
- deletion of **SID** procedure from a flight plan (**Remove Departure?** field);

- creation of WP on DT in minimum distance from selected WP (**Closest Point of FPL?** field);
- setting of interchangeable fields (**Change Fields?** field);
- setting of interchangeable fields in accordance with factory setting (**Restore Defaults?** field).

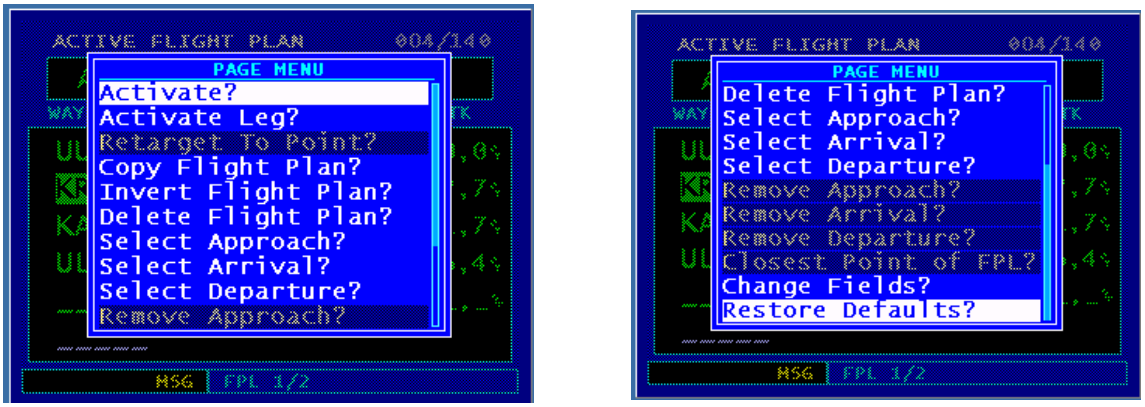


Figure J.3.11

Flight plan activation

To activate a flight plan:

a) set the highlighting on **Activate?** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT button**. Pop-up window with the enquiry about flight plan activation is displayed on RICU display (figure J.3.12);

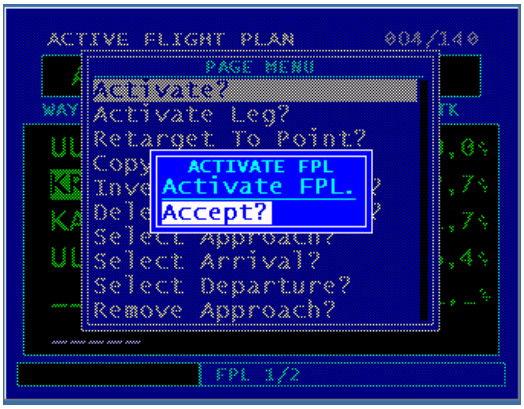


Figure J.3.12

c) press **ENT**. After pressing **ENT**, flight plan is activated, target point is stated and all calculations under a flight plan are done (figure J.3.13).

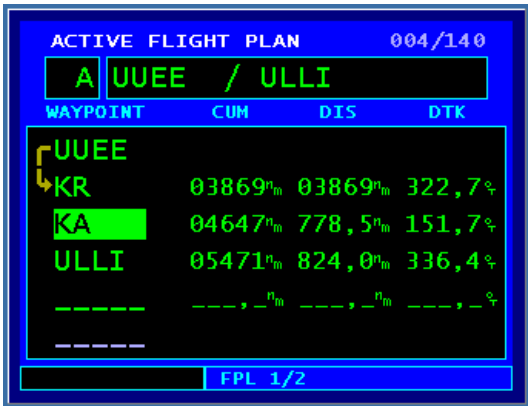


Figure J.3.13

Flight plan leg activation

To activate a flight plan leg:

a) set the highlighting on **FPL1** page to a final WP of a flight plan leg, which should be activated;

b) press **MENU** button;

c) set highlight to field **Activate Leg?** in pop-up menu **PAGE MENU PAGE MENU** (figure J.3.11);

d) press **ENT**. Pop-up window with the enquiry about flight plan leg activation is displayed on RICU display (figure J.3.14);

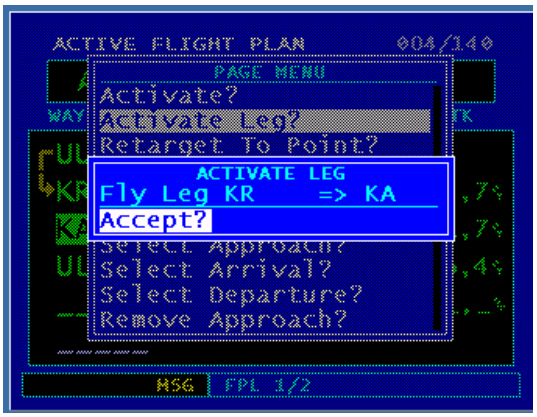


Figure J.3.14

e) press **ENT**. After pressing **ENT**, addition to a flight plan leg is accomplished, an active leg is stated (figure J.3.15) and all calculations under an active flight plan are done (if the first WP is a target point, then a flight to it is executed in **DIRECT TO** mode). If a target point happened to be "passed" in accordance with calculations under a flight plan, then a successive activation of the next flight plan legs is accomplished until "non-passed" is found.

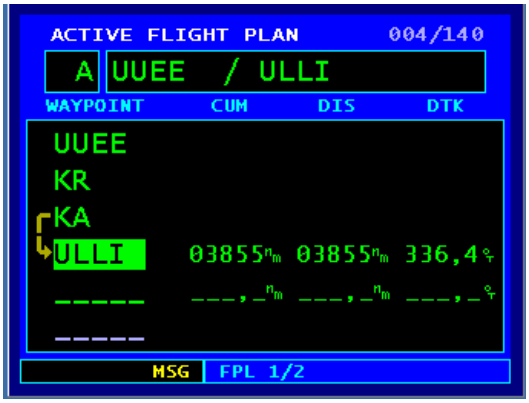


Figure J.3.15

Retarget to WP

Retarget to WP can be accomplished with an active flight plan leg. Retarget can be accomplished both to "non-passed" and to "passed" WP.

To retarget, accomplish the following actions:

a) set highlight on **FPL1** page to identifier of WP, which retarget must be done to;

b) press **MENU** button;

c) set highlight to **Retarget To Point?** field in **PAGE MENU** pop-up window (figure J.3.11);

d) press **ENT**. Pop-up window with the enquiry about retarget to a selected WP is displayed on RICU display (figure J.3.16);

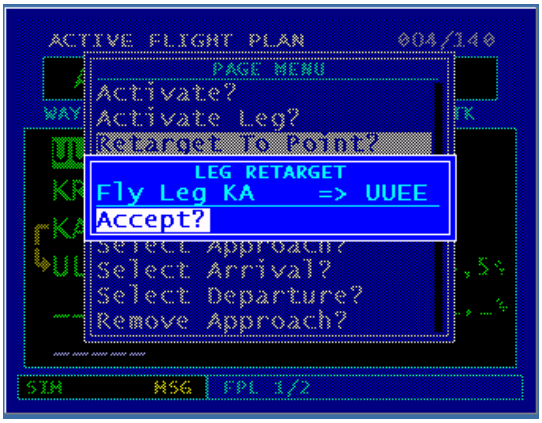


Figure J.3.16

e) press **ENT**. After pressing **ENT,** retarget to a selected WP is accomplished (figure J.3.17).

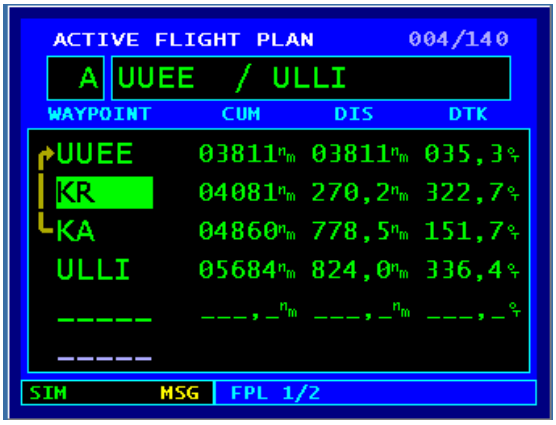


Figure J.3.17

Flight plan copy to memory

To copy a flight plan to memory:

a) set the highlighting to **Copy Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Pop-up window with the enquiry to copy a flight plan to memory stating number of a flight plan is displayed on RICU display (figure J.3.18);

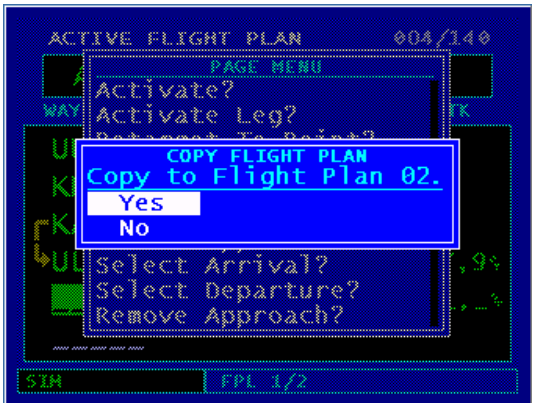


Figure J.3.18

c) press **ENT** to confirm copying. After pressing **ENT,** a flight plan is copied to RICU memory with number, stated in copy enquiry window.

Note – *Copy of a flight plan to memory is impossible to accomplish if* ***SID****,* ***STAR****,* ***APPROACH*** *procedures are available in a flight plan. You should delete these procedures before copying.*

Flight plan reverse

To reverse a flight plan, accomplish the following actions:

a) set the highlighting on **Invert Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. A reverse flight plan is displayed on **FPL1** page. Identifiers of initial and final waypoint will swap in the field of flight plan name, and the sign of a reverse flight plan (rev) will appear, if flight plan name is automatic (figure J.3.19). If input of a flight plan name is manual, no changes in the field of flight plan name will occur.

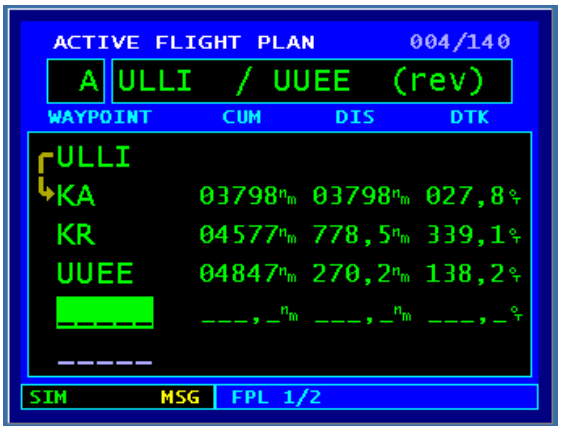


Figure J.3.19

Note

*1 Reverse of a flight plan can not be accomplished if **SID**, **STAR**, **APPROACH** procedures are available in a flight plan. You should delete this procedure before reverse.*

2 To return to initial direction of a flight plan, it is necessary to reverse a flight plan again.

Flight plan deletion

To delete a flight plan:

a) set the highlighting on **Delete Flight Plan** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Information about a flight plan will stop being displayed on the page (figure J.3.4).

Selection of standard APPROACH procedure

To select approach procedure:

a) set the highlighting on **Select Approach?** field in **PAGE MENU** pop-up window (figure J.3.11) ;

b) press **ENT**. Page of selection of **WPT6** approach procedure will appear on RICU display. Identifier of final WP is displayed in the field of WP identifier (figure J.3.20). If final WP is not an airport or an airport of arrival, set identifier of arrival airport in the field of airport identifier;

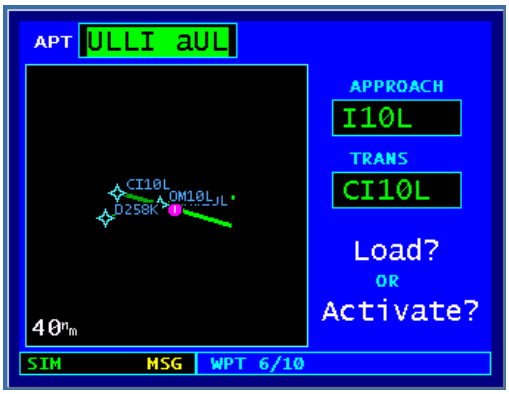


Figure J.3.20

c) press **ENT**. Highlight will move to the field of **APPROACH** procedure;

d) turn internal knob one position further. **APPROACH** pop-up window is displayed on **WPT6** page. Set highlight to the name of required procedure (figure J.3.21);

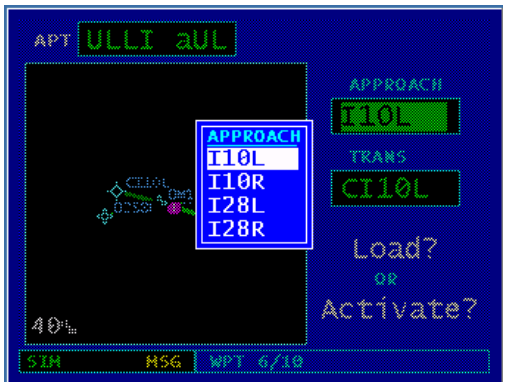


Figure J.3.21

e) press **ENT**. Name of selected procedure is displayed in **APPROACH** field. If selected procedure has only one transit point, then highlight will at once move to **Load?** field, name of transit point is automatically displayed in **TRANS** field (figure J.3.22). If selected procedure has several transit points, then highlight will move to **TRANS** field. Select necessary transit point and press **ENT**. Selection of transit point is accomplished by analogy with selection of procedure name;

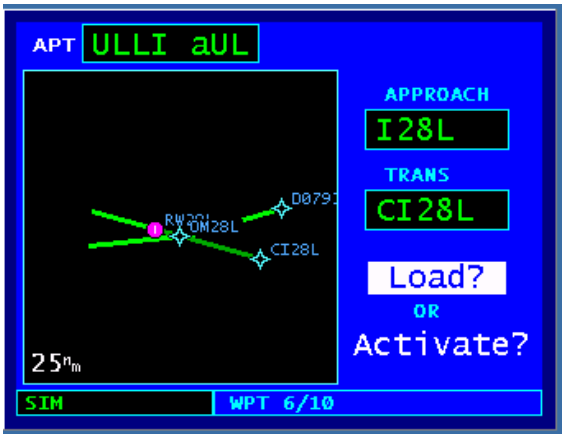
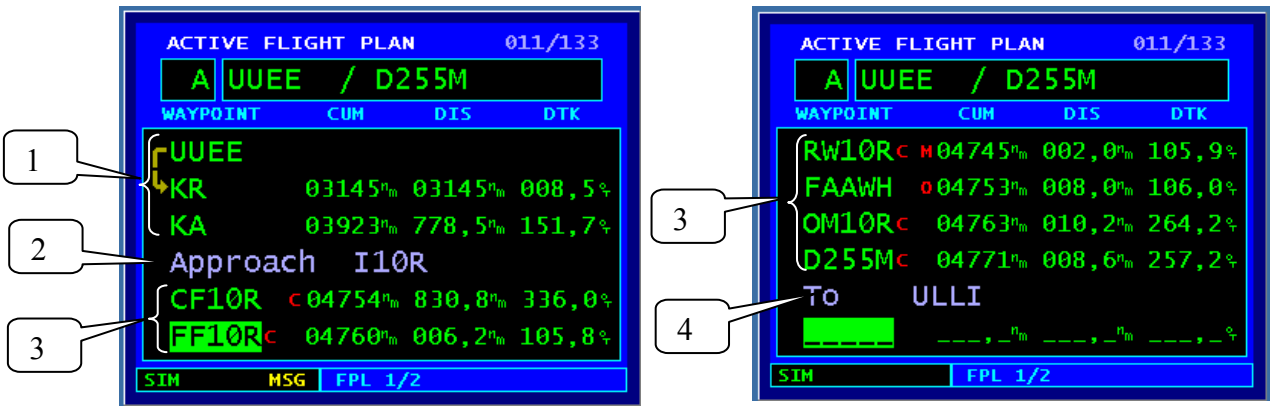


Figure J.3.22

f) press **ENT**. Page **FPL1,** in which points of selected **APPROACH** procedure are included in a flight plan, is displayed on RICU. Identifier of final point of input **APPROACH** procedure is displayed in the field of flight plan name on the place of identifier of final WP (figure J.3.23).

If procedures of arrival and approach were earlier included in a flight plan, they will be deleted from a flight plan, if approach procedure is set for another airport. If approach

procedure is set for the same airport, then only approach procedure set earlier will be deleted, and arrival procedure set earlier will remain in a flight plan.



1 Flight plan points
2 Title of **APPROACH** procedure
3 Points of **APPROACH** procedure
4 Name of the airport on which **APPROACH** procedure is set.

Figure J.3.23

Selection of standard ARRIVAL procedure

To select arrival procedure:

a) set the highlighting on **Select Arrival?** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Selection page of **WPT5** procedure will appear on RICU display. Identifier of final WP is displayed in the field of WP identifier, if final WP is an airport (figure J.3.24). If final WP is not an airport or an arrival airport, set arrival airport in the field of airport identifier;

Figure J.3.24

c) set highlight to the field of **ARRIVAL** procedure name;

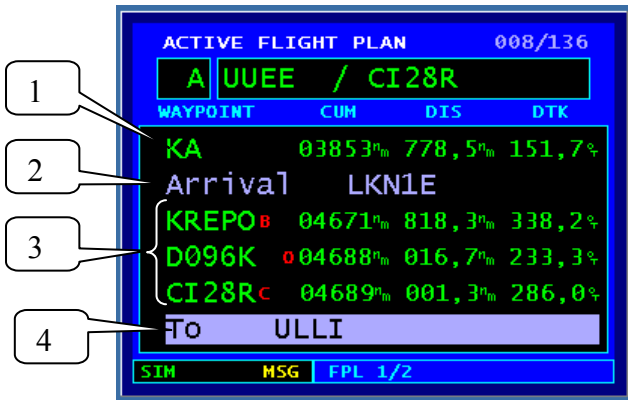
d) turn internal knob one position further. **ARRIVAL** pop-up window is displayed on the **WPT5** page. Set highlight to name of required procedure (figure J.3.25);

Figure J.3.25

e) press **ENT**. Name of selected procedure is displayed in **ARRIVAL** field**.** If selected procedure has only one transit point and one RW, then highlight will at once move to the field **Load?** after selection of procedure (figure J.3.26). If selected procedure has several transit points, then highlight will move to **TRANS** field. Select a required transit point and press **ENT**. If there are several RW for selected procedure, then highlight will move to **RUNWAY** field. Select a required RW and press **ENT** button. Selection of a transit point and RW is accomplished by analogy with selection procedure name. Highlight will move to the field **Load?** (figure J.3.26);

Figure J.3.26

f) press **ENT**. **FPL1** page**,** in which points of selected **ARRIVAL** procedure are included in a flight plan, is displayed on RICU. Identifier of final point of input **ARRIVAL** procedure is displayed in the field of flight plan name on the place of identifier of final WP (figure J.3.27). In case of successive input of **APPROACH** procedure into a flight plan, identifier of final point of input **APPROACH** procedure is displayed in the field of flight plan name on the place of identifier of final WP. If procedure of arrival and approach were earlier included in a flight plan, then they will be deleted from a flight plan when including a new **ARRIVAL** procedure into a flight plan.



1 Flight plan points
2 Title of **ARRIVAL** procedure
3 Points of **ARRIVAL** procedure
4 Name of the airport on which **ARRIVAL** procedure is set.

Figure J.3.27

Selection of standard DEPARTURE procedure

To select departure procedure:

a) set highlight to field **Select Departure?** in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Page of selection departure procedure **WPT4** will appear on RICU display (figure J.3.28). Identifier of initial WP is displayed in the field of WP identifier, if an initial WP is an airport. If initial WP is not departure airport, set identifier of departure airport in the field of airport identifier;

Figure J.3.28

c) press **ENT**. Highlight will move to the field of **DEPARTURE** procedure name;

d) turn internal knob one position further. **DEP** pop-up window is displayed on **WPT4** page. Set highlight to name of required procedure (figure J.3.29);

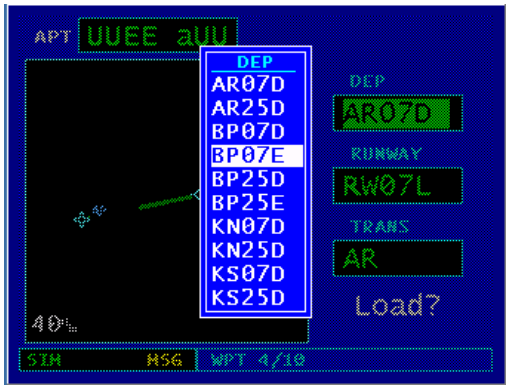


Figure J.3.29

e) press **ENT**. Name of selected procedure is displayed in **DEP** field. If there are several RW for selected procedure, then highlight will move to **RUNWAY** field. Turn internal knob one position further. **RUNWAY** pop-up window is displayed on the **WPT4** page (figure J.3.30)

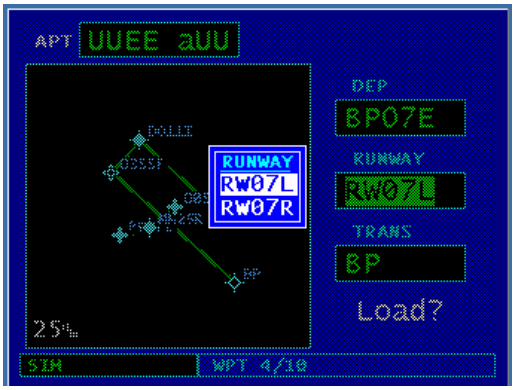


Figure J.3.30

f) select a required RW. Press **ENT**. If selected procedure has only one transit point, then highlight will at once move to the field **Load?**, name of a transit point is automatically displayed in **TRANS** field (figure J.3.31). If selected procedure has several transit points, then highlight will move to **TRANS** field. Select a required transit point and press **ENT**. Highlight will move to the field **Load?** (figure J.3.31). Selection of a transit point is accomplished by analogy with selection procedure name;

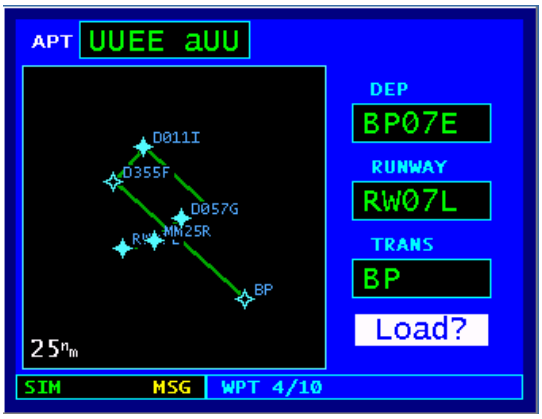
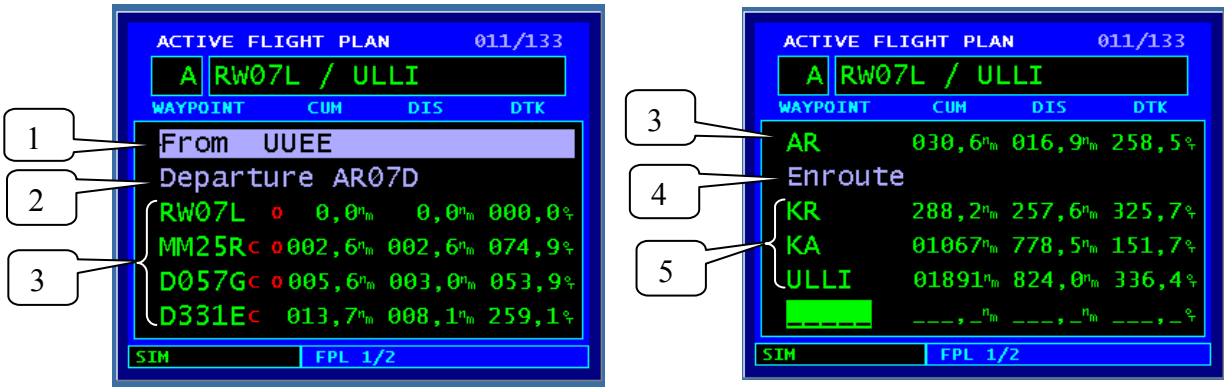


Figure J.3.31

g) press **ENT**. **FPL1** page**,** in which points of selected departure procedure **Departure** are included in a flight plan, will appear on RICU display.

Initial point identifier of input procedure **Departure** (figure J.3.32) is displayed in the field of flight plan name in the place of initial WP identifier. If departure procedure was earlier input in a flight plan, then it will be deleted from the flight plan.



1 Name of airport, which **Departure** procedure is set for
2 Title of **Departure** procedure
3 Points of **Departure** procedure
4 Title of a flight plan
5 Waypoints

Figure J.3.32

Deletion of APPROACH procedure from a flight plan

To delete approach procedure from a flight plan:

a) set highlight to field **Remove Approach?** in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Pop-up window with the request to delete approach procedure is displayed on RICU display (figure J.3.33);

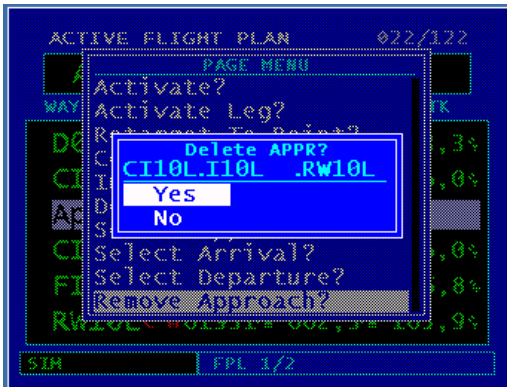


Figure J.3.33

c) press ENT to confirm the deletion of the procedure (to refuse deletion, press the button **CLR** or set highlight to the field **NO** and press **ENT**). Identifier of WP, which has **APPROACH** procedure deleted, is displayed in the field of flight plan name in the place of identifier of final WP. If **ARRIVAL** procedure was included in the flight plan, identifier of final point of **ARRIVAL** procedure is displayed in the field of flight plan name in the place of identifier of final WP.

Deletion of the procedure ARRIVAL from a flight plan

To delete arrival procedure from a flight plan:

a) set highlight to field **Remove Arrival?** in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Pop-up window with the request to delete arrival procedure is displayed on RICU display (figure J.3.34);

Figure J.3.34

c) press **ENT** to confirm the deletion of the procedure (to refuse deletion, press **CLR** button or set highlight to the field **NO** and press **ENT**). If approach procedure was included in the flight plan, then it will be deleted from the flight plan. Identifier of WP, which has **ARRIVAL** procedure deleted, is displayed in the field of flight plan name in the place of identifier of final WP.

Deletion of DEPARTURE procedure from a flight plan

To delete departure procedure from a flight plan:

a) set highlight to **Remove Departure** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. Pop-up window with the request to delete departure procedure is displayed on RICU display (figure J.3.35);

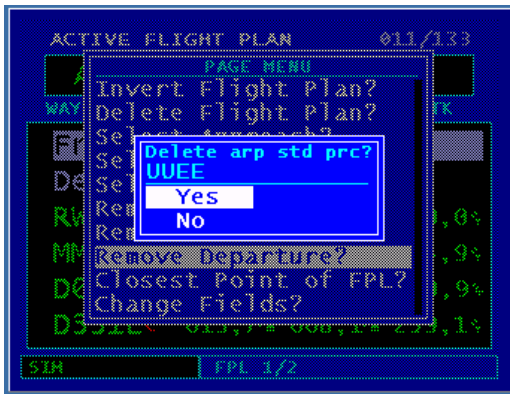


Figure J.3.35

c) press **ENT** to confirm the deletion of the procedure (to refuse deletion, press **CLR** button or set highlight to the field **NO** and press **ENT**). Identifier of WP, which has **DEPARTURE** procedure deleted, is displayed in the field of flight plan name in the place of identifier of initial WP.

Setup of interchangeable fields

To setup interchangeable fields:

a) set highlight to field **Change Fields?** in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**. **PAGE MENU** window will stop being displayed on **FPL1** page, and mnemonic symbol of one of the interchangeable fields will be highlighted;

c) set highlight to mnemonic symbol of the parameter, which must be changed;

d) turn internal knob one position further, **SELECT FIELD TYPE** pop-up window is displayed on **FPL1** page in accordance with J.3.36, if the interchangeable field position.9, 10 is changed, or in accordance with figure J.3.37, if the interchangeable field position.8 is changed (figure J.3.1);

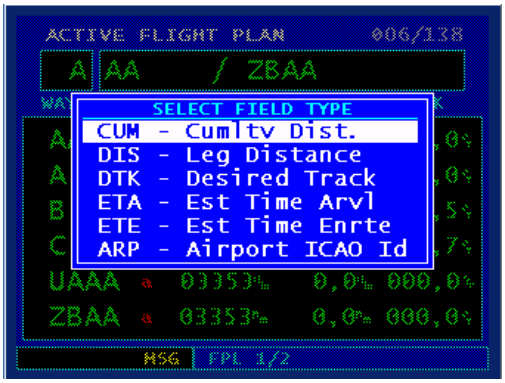


Figure J.3.36

Figure J.3.37

e) set highlight to required parameter;

f) press **ENT** to confirm the change by required parameter. **SELECT FIELD TYPE** window will stop being displayed on the **FPL1** page. Required parameter is displayed in selected interchangeable field.

Setup of interchangeable fields according to factory setting

To setup interchangeable fields in accordance with factory setting:

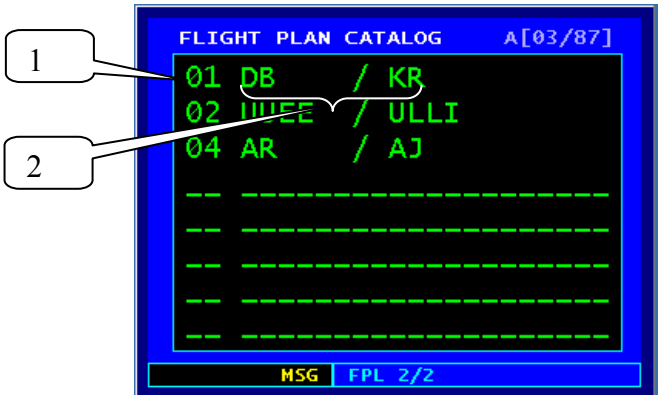
a) set highlight to **Restore Defaults?** field in **PAGE MENU** pop-up window (figure J.3.11);

b) press **ENT**;

c) **PAGE MENU** pop-up window will stop being displayed on **FPL1** page. Interchangeable fields in accordance with factory setting will be displayed on **FPL1** page.

FPL2 page

View of **FPL2** page (**Flight Plan Catalog**) with flight plans available is shown in figure J.3.38.



1 Flight plan number
2 Flight plan name field can display:
- identifier of initial WP / identifier of final WP;
- identifier of initial WP / identifier of final WP (rev) – if reverse flight plan;
- name input by operator

Figure J.3.38

Deletion of a flight plan from flight plan catalogue

To delete a flight plan from flight plan catalogue:

a) set highlight on **FPL2** page to the field of flight plan which must be deleted from flight plan catalogue;

b) press **CLR** button. Pop-up window with the enquiry to delete highlighted flight plan is displayed on RICU display (figure J.3.39);

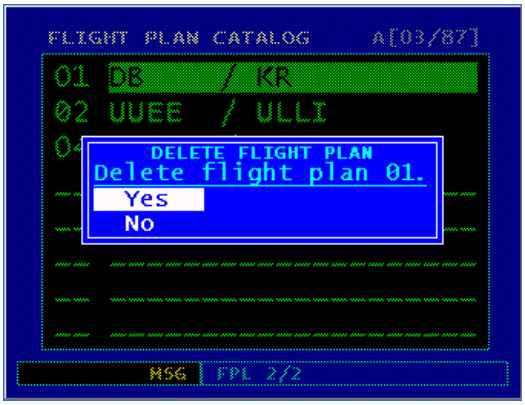


Figure J.3.39

c) press **ENT** to confirm the deletion of the flight plan (to refuse deletion, press **CLR** button or set highlight to **NO** field and press **ENT**).

Detailed overview of a flight plan

For detailed overview of a flight plan:

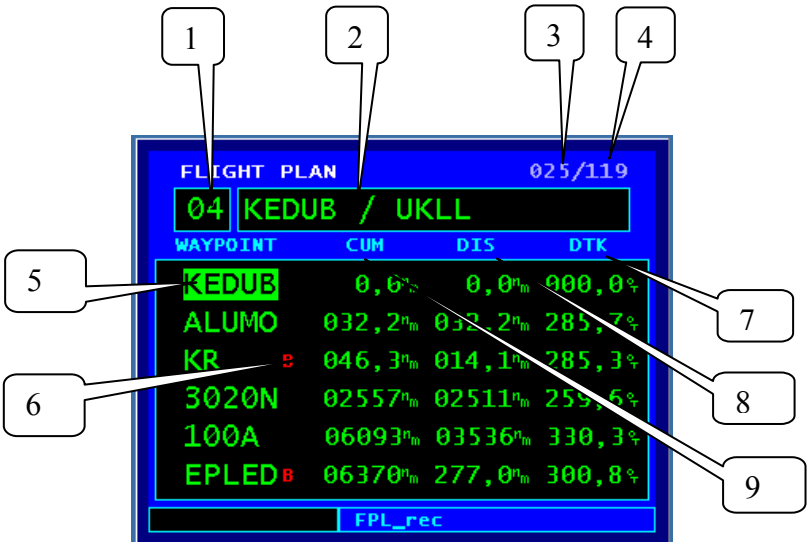
a) set highlight on **FPL2** page to the field of flight plan which should be overviewed;

b) press **ENT**. **FPL_rec** window (figure J.3.40), which contains detailed information about selected flight plan, is displayed on RICU display;

c) press **CRSR** button to return from **FPL_rec** window to **FPL2** page.

Description of FPL_rec window

Detailed information about selected flight plan is displayed in **FPL_rec** window.



1 Flight plan number
2 Flight plan name field can display:
- identifier of initial WP / identifier of final WP;
- identifier of initial WP / identifier of final WP (rev) – if to accomplish reverse flight plan;
- flight plan name input by operator;
- D► and identifier of TP, not included in active flight plan – when accomplishing flight in **DIRECT TO** mode (figure J.3.2);
- D► and identifier of current TP ~ Q ~ and identifier of TP, being in the queue - when accomplishing flight in **DIRECT TO** mode with putting WP in the queue (figure J.3.3)

3 Number of WP in a flight plan
4 Number of WP possible to input in a flight plan
5 WP identifier
6 Reference designation of WP
7-9 Interchangeable fields

Figure J.3.40

Figure J.3.40 shows factory setting of interchangeable fields. List of parameters, which can be displayed in interchangeable fields 7-9, is shown in table J.3.3. List of possible reference designations is shown in table J.3.4.

Table J.3.3

Designation in the form	Parameter	Interchangeable field
CUM	Total distance to final WP in desired track	pos.8, 9
DIS	Length of flight plan leg along DT	pos.8, 9
DTK	Desired track angle	pos.8, 9
ESA	Safe flight altitude of the flight plan	pos.7

Table J.3.4

Reference designation of WP	Parameter	Description
a..	ABSENT	Point not found in NDB
.b.	BAD	Error is registered for a point (for example, point coordinates failed to be loaded)
B..	Report	Point of report about passing
Note - *Symbol «·» indicates decade in reference designation of WP*		

Flight plan editing

Flight plan editing in **FPL_rec** window means execution of the following operations:

- deletion of WP form a flight plan;
- input of a new WP into a flight plan;
- input of a leg of standard lane into a flight plan;

These three operations in **FPL_rec** window are accomplished by analogy with operations stated in **FPL2** page description.

Operations performed in FPL_rec window when pressing MENU button

PAGE MENU pop-up window (figure J.3.41) is displayed in the window **FPL_rec** by pressing **MENU** button**,** its fields are used to accomplish the following operations:

- flight plan activation (**Activate Flight Plan?** field);
- copy of flight plan in memory (**Copy Flight Plan?** field);
- flight plan reverse (**Invert Flight Plan?** field);
- flight plan deletion (**Delete Flight Plan?** field);
- creation of WP on DT in minimum distance from selected WP (**Closest Point of FPL?** field);
- setup of interchangeable fields (**Change Fields?** field);
- setup of interchangeable fields in accordance with factory setting (**Restore Defaults?** field).

Note - Copy Flight Plan? and Closest Point of FPL? fields are not used.

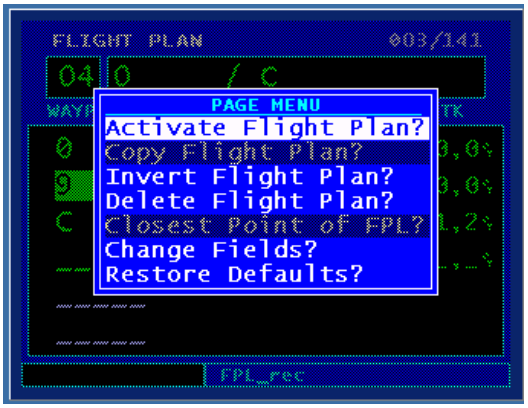


Figure J.3.41

Operations in **FPL_rec** window by pressing **MENU** button are accomplished by analogy with respective operations described in **FPL1** page**.**

Operations being accomplished on FPL2 page by pressing MENU button

PAGE MENU pop-up window (figure J.3.42) is displayed on **FPL1** page by pressing **MENU** button, its fields are used to accomplish the following operations:

- flight plan activation (**Activate Flight Plan?** field);
- flight plan reverse (**Invert Flight Plan?** field);
- creation of a new flight plan (**Create New Flight Plan?** field);
- copy of flight plan in memory (**Copy Flight Plan?** field);
- flight plan deletion (**Delete Flight Plan?** field);
- deletion of all flight plans (**Delete All Flight Plan?** field);
- flight plans sorting by numbers and alphabet (**Sort List By Number?** or **Sort List By Comment?** field).

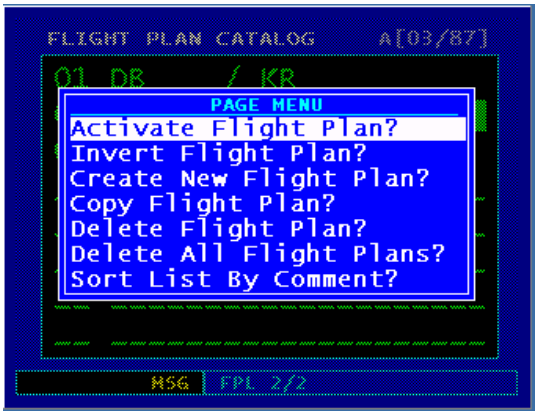


Figure J.3.42

Flight plan activation

To activate a flight plan:

a) set highlight on **FPL2** page to the field with a flight plan which should be activated;

b) press **MENU** button;

c) set highlight to the **Activate Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.42);

d) press **ENT**. RICU display will show **FPL1** page, which will contain information about selected flight plan with active flight plan leg stated.

Flight plan reverse

For flight plan reverse:

a) set highlight on **FPL2** page to the field with a flight plan which should be reversed;

b) press **MENU** button;

c) set highlight to **Invert Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.42);

d) press **ENT**. Identifiers of initial and final waypoint will swap in the field of selected flight plan on **FPL2** page, and the sign of a reverse flight plan (**rev**) will appear, if flight plan name is automatic (figure J.3.43). If input of a flight plan name is manual, no changes in the field of flight plan name will occur.

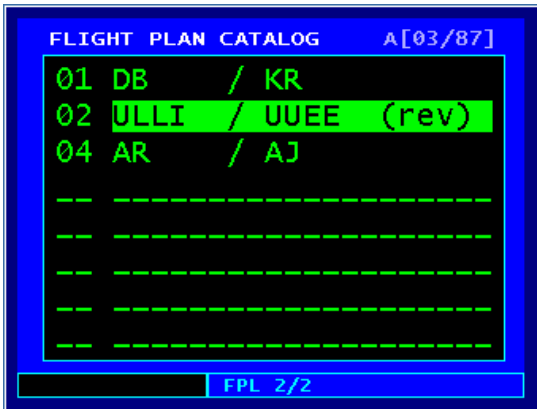


Figure J.3.43

Creation of a new flight plan

To create a new flight plan:

a) set highlight to **Create New Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.42);

b) press **ENT**. RICU display will show **FPL_rec** window with number of a flight plan being created (figure J.3.44);

Figure J.3.44

c) turn internal knob one position further. RICU display will show **fpl_add** window in accordance with figure J.3.45;

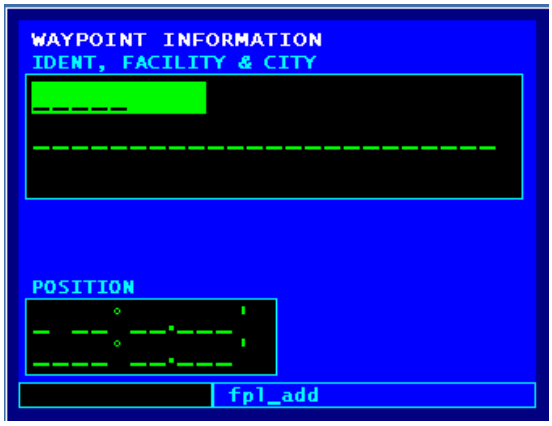


Figure J.3.45

d) input identifier of WP. Input of identifier is accomplished by analogy with described in **FPL1** page (input of a new WP in a flight plan);

e) after confirmation of the input, RICU display will show **FPL_rec** window with WP input (figure J.3.46);

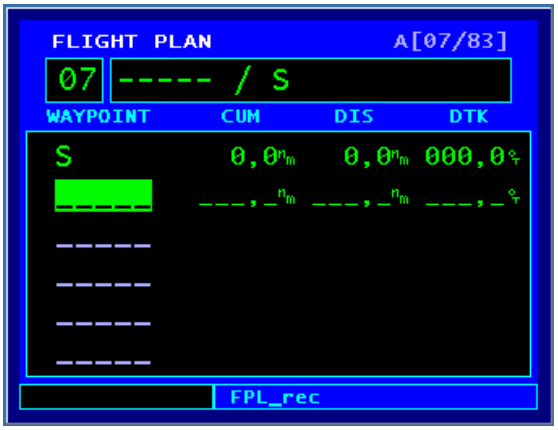


Figure J.3.46

f) input all necessary WP;

g) input flight plan name if necessary. By default, set flight plan name automatically: identifier of initial WP / identifier of final WP;

h) press **CRSR** button. RICU display will show **FPL2** page. Created flight plan will be added to a flight plan catalogue.

Flight plan deletion

To delete a flight plan, perform the following operations:

a) set highlight on **FPL2** page to the line with a flight plan which should be deleted;

b) press **MENU** button;

c) set highlight to **Delete Flight Plan?** field in **PAGE MENU** pop-up window (figure J.3.42);

d) press **ENT**. Pop-up window with the enquiry to confirm highlighted flight plan deletion is displayed on RICU display (figure J.3.47);

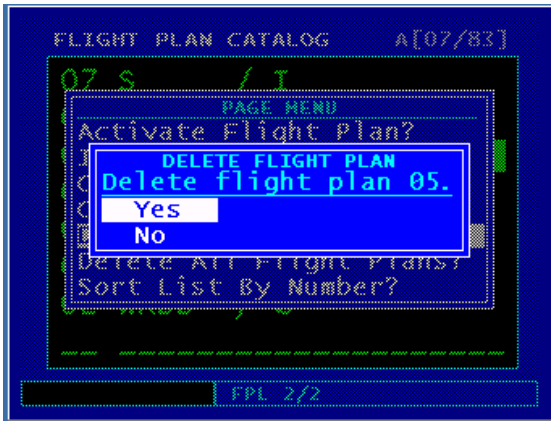


Figure J.3.47

e) press **ENT** to confirm deletion (to refuse deletion, press **CLR** button or set highlight to **NO** field and press **ENT**).

Deletion of all flight plans

To delete all flight plans perform the following operations:

a) set highlight to **Delete All Flight Plans** field in **PAGE MENU** pop-up window (figure J.3.42);

б) press **ENT**. Pop-up window with the request to confirm deletion of all flight plans highlighted is displayed on RICU display (figure J.3.48);

Figure J.3.48

c) press **ENT** to confirm deletion (to refuse deletion, press **CLR** button or set highlight to the **NO** field and press **ENT**). Flight plan catalogue on **FPL2** page will be empty (figure J.3.49).

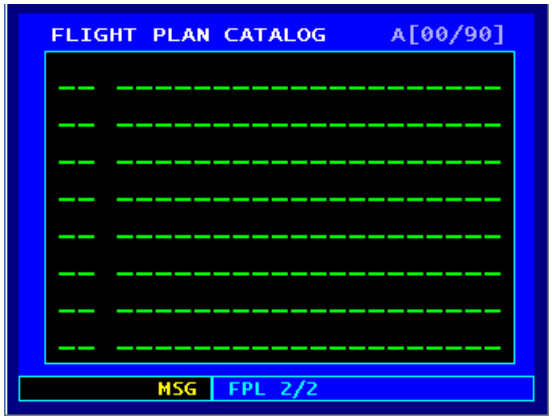


Figure J.3.49

Flight plans sorting by numbers and alphabet

To sort flight plan by numbers or alphabet:

a) set highlight to the **Sort List By Number?** or **Sort List By Comment?** field in **PAGE MENU** pop-up window (figure J.3.42);

Note – *If flight plans on **FPL2** page were sorted by flight plan numbers, then **PAGE MENU** page will display the request to sort by alphabet **Sort List By Comment?** and vice versa.*

b) press **ENT**. Sorting of flight plans according to the request will be effected on the **FPL2** page.

J.4 Operation description in ~~D~~ form

The **D** fo~~rm~~ is used to set a flight in **DIRECT TO** mode.

DIRECT TO mode ensures a quick selection of a target point and a possibility to set an angle of flyover of a target point.

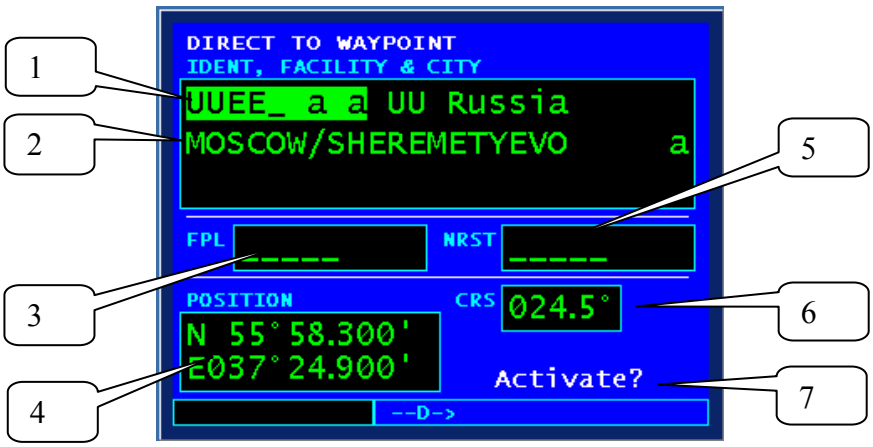
After flight activation in **DIRECT TO** mode equipment computes the desired track from ACP to selected target point along the line of great circle (orthodromy) and accomplishes a flight to the target point. Angle of flyover of the target point, set in **CRS** field, allows to change DT primary calculation.

Flight along computed DT is kept until **DIRECT TO** mode is cancelled or a new point of a flight plan (target point) is stated.

Equipment enables to put a point in the queue for execution of a flight in **DIRECT TO** mode.

Entry into **D** form is ~~acc~~omplished by pressing **D** button on RICU ~~dis~~play.

View of **D** form i~~s sh~~own in figure J.4.1.



1 TP identifier
2 City /TP name
3 Field of selection of TP from an active flight plan
4 Latitude, longitude TP
5 Field of selection of TP from the list of nearest airports
6 Field of setting an angle of flyover of a target point
7 Field of activation confirmation can take on the following values:
- **Activate** - activate;
- **[ENT] DUPS** – message about availability of several points with set identifier (name)

Figure J.4.1

Selection of a target point and setting a flight in DIRECT TO mode

Selection of a target point and setting a flight in **DIRECT TO** mode is accomplished from D form:→

- by identifier or name (with a possibility to create a new user NP);
- by identifier from the list of WP of an active flight plan;
- by identifier from the list of the nearest airports.

Target point can be also set from **NAV**, **FPL**, **NRST**, **WP** forms.

After selection of a target point, if necessary, a required angle of flyover of target point can be set in **CRS** field (see figure J.4.1), in this case a new DT is formed and it passes through target point with set angle of flyover of target point.

Selection of a target point by identifier or name setting a flight in DIRECT TO mode

To select a target point by identifier or name:

a) in **D** form set highlight to the certain identifier (name) field. Input identifier (name) of TP, to which the flight will be accomplished in **DIRECT TO** mode;

b) press **ENT**. If there are several points in NDB with set identifier (name), RICU display will show **DUPLICATE WAYPOINTS** pop-up window with the list of regions, where waypoints with selected identifier (name) are located (figure J.4.2). Set highlight to the field with required region;

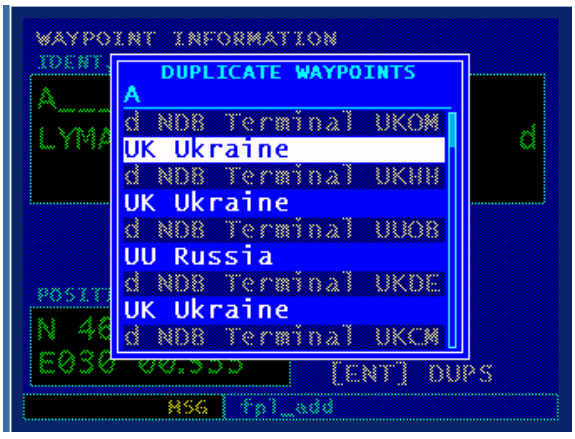


Figure J.4.2

c) press **ENT**, **DUPLICATE WAYPOINTS** pop-up window will stop being displayed on RICU display, the field **ACTIVATE?** will be highlighted;

d) press **ENT** to confirm accomplishment of a flight in **DIRECT TO** mode to the set TP. Display RICU will show **NAV1** page with information about flight in **DIRECT TO** mode to selected point (figure J.4.3). Information about flight in **DIRECT TO** mode to selected target point is displayed in the field of flight plan name on **FPL1** page (figure J.3.2).

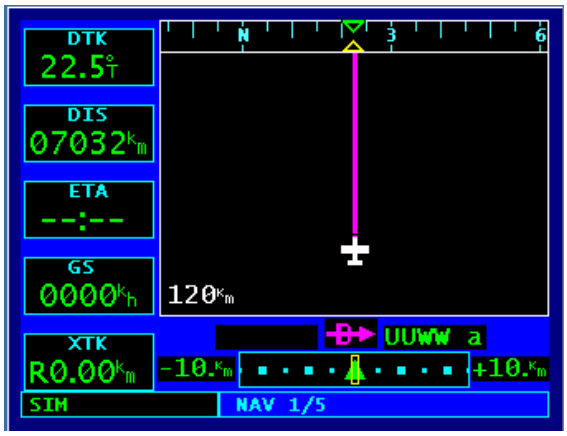


Figure J.4.3

Selection of a target point by identifier from the list of WP of an active flight plan and setting a flight in DIRECT TO mode

To select a target point by identifier from the list of WP of an active flight plan and setting a flight in **DIRECT TO** mode:

a) in **D** ~~form~~ set highlight to **FPL** field (figure J.4.1);

b) turn internal knob one position further. **FPL** pop-up window with the list of WP of an active flight plan will be displayed on RICU (figure J.4.4);

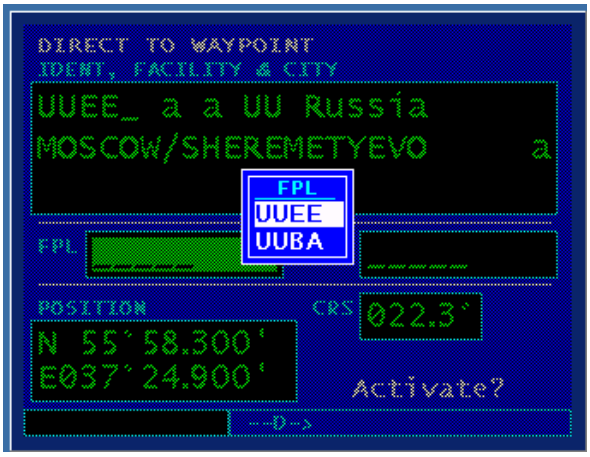


Figure J.4.4

c) set highlight to required target point from the list of WP;

d) press **ENT**. Fields of **D** form (except the field **NRST**) are filled with information about selected target point. **Activate?** field will be highlighted;

e) press **ENT** to confirm activation of the flight to selected target point. RICU display will show **NAV1** page with information about the flight to selected point in **DIRECT TO** mode. **FPL1** page displays the arrow pointing to target point identifier.

Selection of a target point from the list of the nearest airports and setting a flight in DIRECT TO mode

To select a target point from the nearest airports and for the flight task in **DIRECT ON** mode:

a) in **D** form set highlight to the **NRST** field;

b) turn internal knob one position further. RICU display will show **NEAREST** pop-up window with the list of the nearest airports (figure J.4.5);

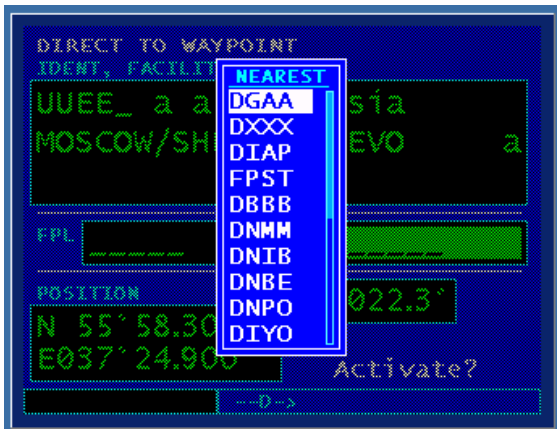


Figure J.4.5

c) set highlight to required target point from the list;

d) press **ENT**. The field of **D** form (except **FPL** field) are filled with information about selected target point. **Activate?** field will be highlighted;

e) press **ENT** to confirm activation of the flight to selected target point. RICU display will show the page **NAV1** with information about the flight to selected point in **DIRECT TO** mode. Information about flight in **DIRECT TO** mode to selected target point is displayed in the field of flight plan name on **FPL1** page (figure J.3.2).

Selection of a target point and setting a flight in DIRECT TO mode from NAV, FPL, NRST, WP forms

To set a flight in **DIRECT TO** mode from **NAV1** and **NAV2** mode:

a) press the button **D→**. RICU display will show the form **D→**. Data of a target point (current WP) are displayed in informational fields;

b) activate the flight to target point in **DIRECT TO** mode (set highlight to the field **Activate?** and press **ENT**). RICU display will show **NAV1** page, which represents the flight in **DIRECT TO** mode. Information about flight in **DIRECT TO** mode to target point is displayed in the field of flight plan name on **FPL1** page (figure J.3.2).

To select a target point and set a flight in **DIRECT TO** mode from the forms **FPL**, **NRST**, **WP**:

a) set highlight to identifier of WP, which should be used as TP;

b) press the button **D▶**. RICU display shows the form **D▶**, its informational fields displays data of selected TP;

c) activate flight to selected target point (set highlight to the field **Activate?** and press **ENT**). RICU display shows **NAV1** window, representing flight in **DIRECT TO** mode to selected TP.

Queuing of second target point

If a flight to a new target point should be activated after finishing the flight to current target point, accomplish the following actions:

a) being in the form **D▶**, press the button **D▶** once more. Additional message (**QUEUE**) about queuing of a new target point will appear in the form **D▶** (figure J.4.6);

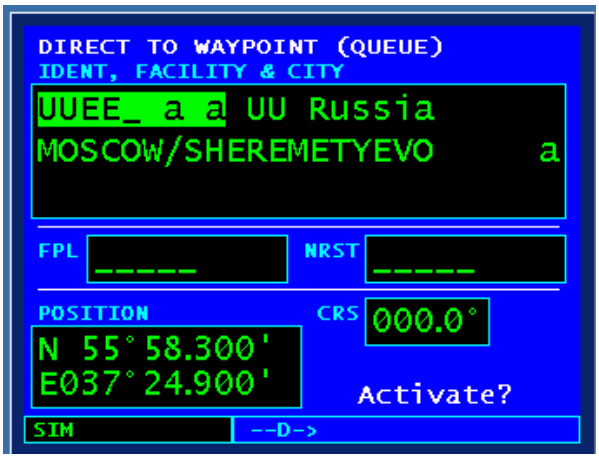


Figure J.4.6

b) select a target point and set **DIRECT TO** mode according to methods described above;

c) press **ENT** to confirm queuing of a new target point. RICU display shows the page **NAV1**, which represent a flight **DIRECT TO** target point set earlier. A new target point is put in the queue. Information about flight in **DIRECT TO** mode to current target point and about queuing of a new target point is displayed on the page **FPL1** in flight plan name field (figure J.3.3).

Cancellation of a flight in DIRECT TO mode to set target point and setting a flight in DIRECT TO mode to another target point

To cancel a flight to target point set earlier and to set a flight to another TP:

a) select another target point and set a flight in **DIRECT TO** mode according to methods described above;

b) after confirmation of a flight in **DIRECT TO** mode to another target point, RICU display will show **NAV1** page with information about a flight in **DIRECT TO** mode to newly selected target point.

Setting of an angle of flyover of a target point

If it is necessary to set an angle of flyover of a target point:

a) set highlight to **CRS** field**,** after selection of a target point (by one of methods described above) in the form **D►**;

b) set a necessary value of an angle of flyover of a target point;

c) press **ENT** to confirm a selected angle of flyover of a target point;

d) activate a flight to a target point with a selected angle of flyover.

Cancellation of a flight in DIRECT TO mode

To cancel a flight in **DIRECT TO** mode:

a) press the button **D►**. RICU display will show the form **D►**, its fields are filled with data of the target point;

б) press the button **MENU**. The window according to figure J.4.7 is displayed in the form **D►**

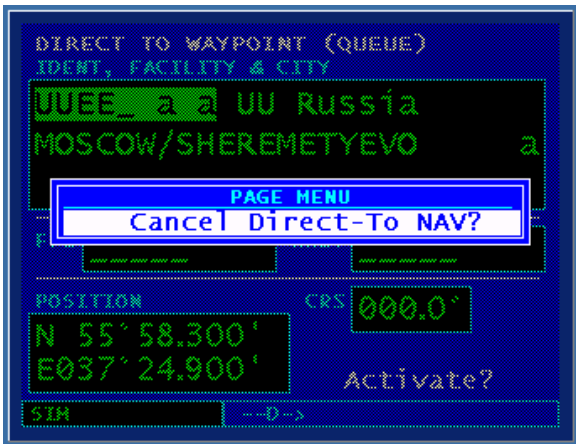


Figure J.4.7

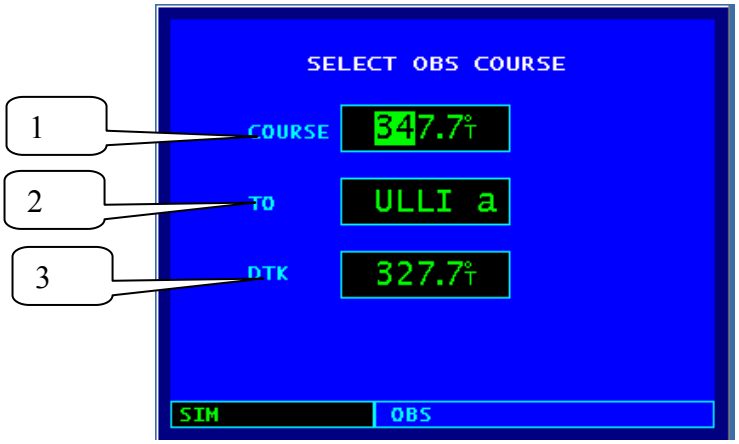
в) press **ENT** to confirm cancellation of a flight in **DIRECT TO** mode. After cancellation of a flight in **DIRECT TO** mode and with an active flight plan available, accomplish activation of a flight to required flight plan leg.

J.5 Operation description in OBS form

The form **OBS** is intended to set a flight in **OBS** mode. **OBS** mode provides movement to WP with set angle of flyover when flying according to a flight plan or in **DIRECT TO** mode.

Entry to **OBS** form is accomplished by pressing **OBS** button if an active flight plan leg is available.

View of **OBS** form is shown in figure J.5.1.



1 Angle of flyover of a target point
2 Identifier of a target point
3 Desired track angle

Figure J.5.1

Setting a flight in OBS mode

For efficient movement to WP with set angle of flyover:

a) input value of an angle of flyover of target point;

b) press **ENT**.

After pressing **ENT,** flight under the flight plan is cancelled, new DT is formed, which passes a target point with set angle of flyover of target point. RICU display shows **NAV1** page. View of **NAV1** page after setting **OBS** mode is shown in figure J.5.2.

Figure J.5.2

When accomplishing a flight in **OBS** mode, highlight of **OBS** button blinks.

After passing of a target point, AC continues a flight along DT, which passes through WP with desired track angle. Immovable symbol of AC «▲», located in the middle of DT scale, after passing a target point looks like «▼».

Cancellation of a flight in OBS mode

To cancel a flight of AC along desired track angle, press **OBS** button. After pressing **OBS** button**, OBS** button highlight goes down, and equipment provides:

- moving of AC along LLT to nearest flight plan leg, if **OBS** mode was set for flight plan leg;
- flight in **DIRECT TO** mode to a target point, if **OBS** mode was set during flight execution in **DIRECT TO** mode.

Cancellation of a flight of AC **OBS** mode also occurs when:

- a new flight plan is activated;
- a flight plan leg is activated;
- setting a flight in **DIRECT TO** mode.

J.6 Operation description in WP form

WP form is intended to overview NDB information.

WP form contains 10 pages:

– **WPT1 - WPT6 –** pages for overview of NP of airport category (**APT**);

– **WPT7** - page for overview of NP of flight plan intersection point category (**Intersection**);

– **WPT8** - page for overview of NP of nondirectional beacons category (**NDB**);

– **WPT9** - page for overview of NP of omnidirectional USW-beacons category (**VOR**);

– **WPT10** – page for work with NP of user WP category (**User WP**).

Entry into **WP** form is accomplished by pressing the button **WP** on the front panel of RICU. RICU display shows the form, which was on RICU display prior to activation of **WP** form, by repeated pressing **WP** button.

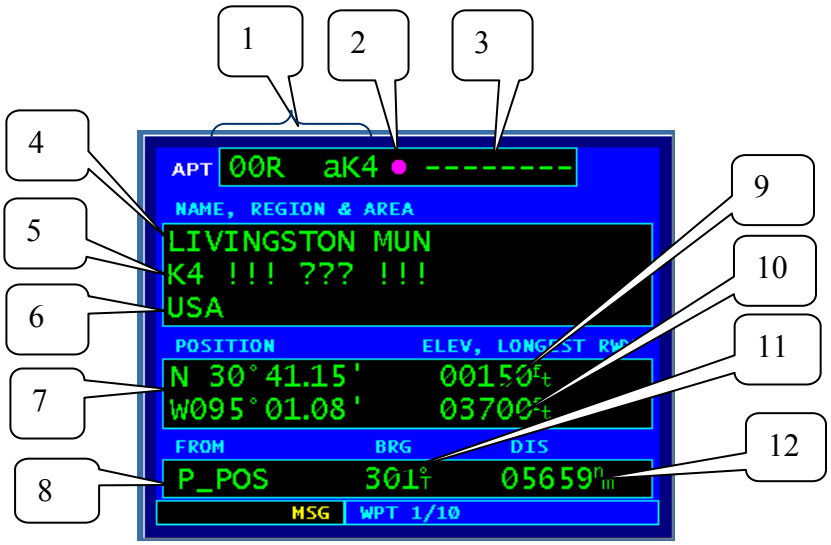
When entering **WP** form RICU display always shows **WPT1** page. Switching of the form **WP** pages is accomplished by rotating internal knob.

Note – *In the case of absence of the navigation database storage removable unit in RICU, work with NP of user's category is available only. The work with other NP categories is not available.*

WPT1 page

WPT1 page is used for overview of information about NP of airport category (**APT**).

View of **WPT1** page is shown in figure J.6.1.



1 Airport identifier
2 Reference designation of airport:
- - no information about RW surface;
- - private airport;
- - airport with soft RW surface;
- - airport with hard RW surface;
- - water

3 Airport category. It can take on the following values:
- **CIVIL** - civil;
- **MILITARY** - military;
- **PRIVATE** - private;
- «------» - category is not defined

4 Airport name
5 Country region, where airport is located
6 Earth region, where airport is located
7 Latitude, longitude of airport
8 Symbol of current position of AC
9 Airport altitude
10 Length of the longest RW of airport
11 Bearing to airport from current position
12 Distance to airport from current position

Figure J.6.1

Overview of airport information

For overview of airport information:

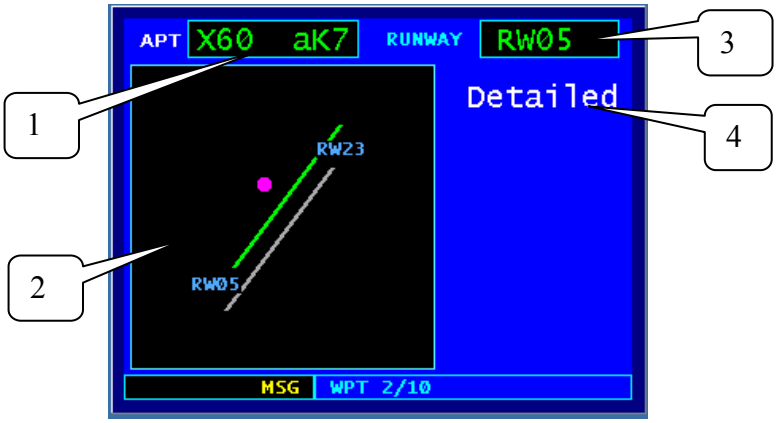
a) set highlight to the field of airport identifier (name);

b) input identifier (name) of a required airport;

c) press **ENT** to confirm input. Information about airport with selected identifier (name) is displayed in fields of the pages **WPT1 – WPT6**.

WPT2 page

WPT2 page is used for overview of information about airport RW. View of **WPT2** page with information about airport RW is shown in figure J.6.2. View of **WPT2** page without information about airport RW is shown in figure J.6.3.



1 Airport identifier
2 Graphic representation of all RW and reference point of airport (RW, selected in the field **RUNWAY** is displayed in green colour, others are in grey colour)
3 Field of airport RW name
4 Request for detailed airport overview

Figure J.6.2

Figure J.6.3

Overview of RW airport information

For RW airport information overview, perform the following operations:

a) set highlight to the field of airport identifier, input identifier of airport, which RW information it is required to overview;

b) press **ENT**. Highlight will move to the field of RW name (figure J.6.4);

Figure J.6.4

c) turn internal knob one position further. **RUNWAY** pop-up window is displayed on **WPT2** page (figure J.6.5);

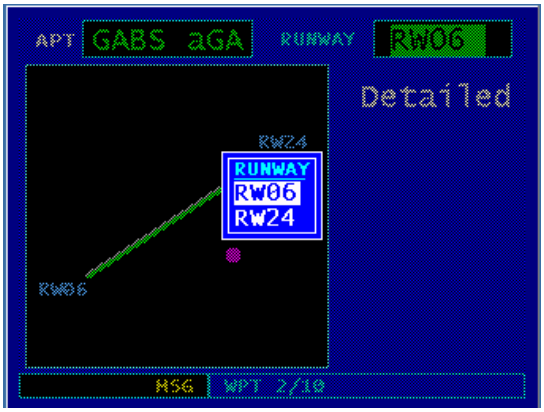


Figure J.6.5

d) set highlight to name of RW, which information it is necessary to overview;

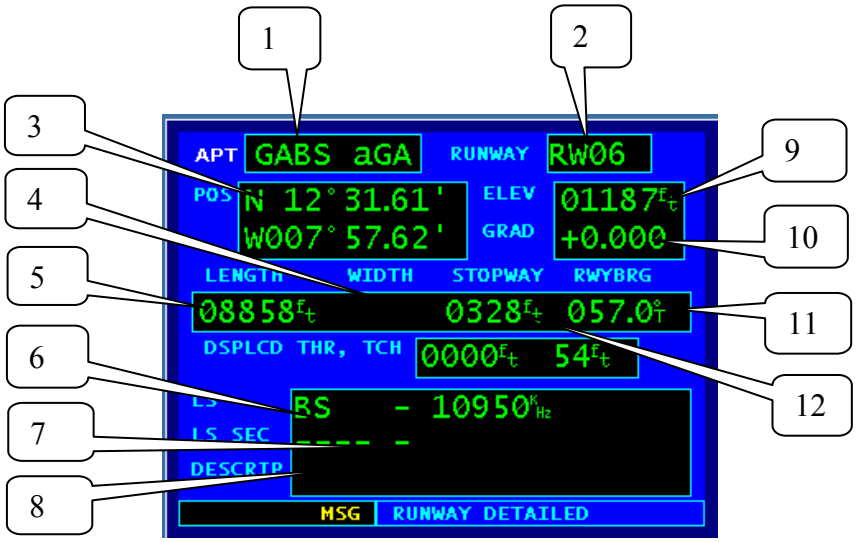
e) press **ENT**. Highlight will move to the field of enquiry for detailed overview of information about selected RW of airport **Detailed**;

f) press **ENT**. RICU display shows **RUNWAY DETAILED** window, which represent information about selected RW (figure J.6.6);

g) press **CLR** button**,** to return from **RUNWAY DETAILED** window to **WPT2** page.

Description of RUNWAY DETAILED window

RUNWAY DETAILED window is used for overview of detailed information about selected RW of an airport.



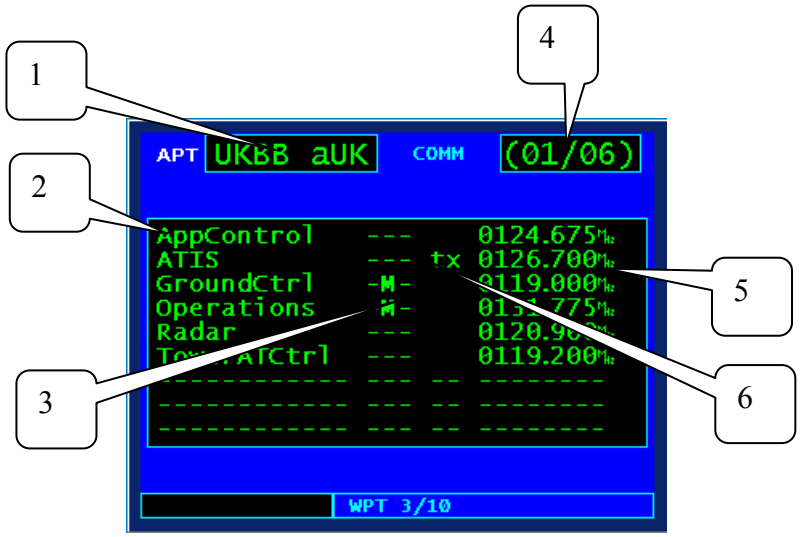
1 Airport identifier
2 Identifier of selected RW
3 Latitude, longitude of RW end, degrees, minutes, minute part
4 Width of RW
5 Length of RW
6 Identifier and frequency of the main RW beacon
7 Identifier and frequency of the second RW beacon
8 Additional information about RW
9 Elevation of RW
10 Slope of RW
11 Bearing of RW
12 Distance from the beginning of RW to touchdown point
13 Altitude above RW threshold at the aircraft normal descent
14 Distance from RW edge to RW threshold

Figure J.6.6

WPT3 page

WPT3 page is used for overview of information about radiocommunication equipment of an airport.

View of **WPT3** page is shown in figure J.6.7.



1 Airport identifier
2 List of radiocommunication equipment of airport
3 Service-indicator
4 Number of radiocommunication equipment/quantity of radiocommunication equipment of airport
5 Frequency
6 Mode of operation of radiocommunication equipment:
- tx - receiver;
- rx - transmitter ;
- «-----» - not defined in database

Figure J.6.7

List of radiocommunication equipment, which can be available in an airport, is shown in table J.2.2, values, which service-indicator can take on, are shown in table J.2.3.

Overview of radiocommunication equipment of airport

For overview of information about radiocommunication equipment of airport, fulfil the following actions:

a) set highlight to the field of airport identifier. Input identifier of airport, which radiocommunication equipment information it is necessary to overview;

b) press **ENT**. Highlight will move to the field of display of information about radiocommunication equipment of airport. By rotating internal knob clockwise, highlight will move through lines until the last line of the field. By rotating internal knob anticlockwise, highlight will move through lines until the upper line of the field (figure J.6.8).

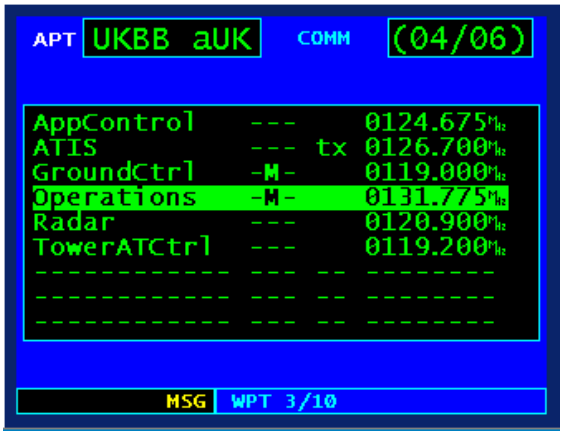
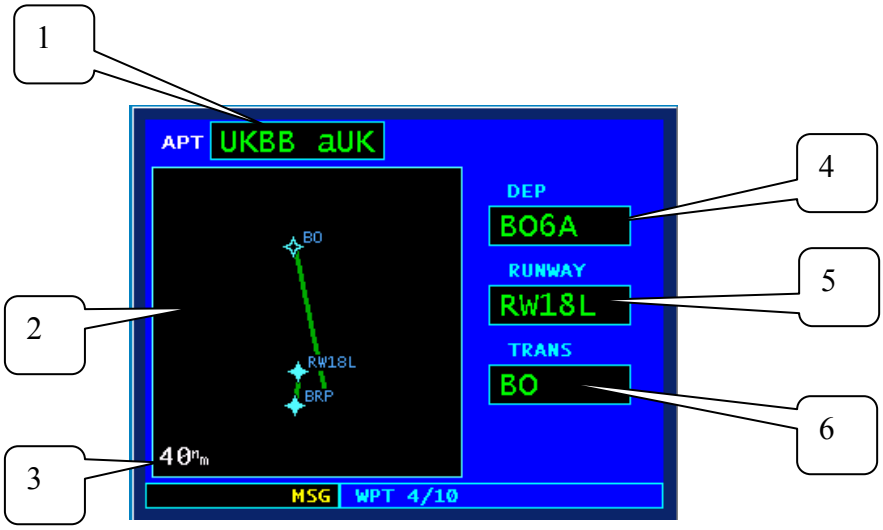


Figure J.6.8

WPT4 page

WPT4 page is used for overview of procedures **SID**.

View of **WPT4** page is shown in figure J.6.9.



1 Airport identifier
2 Field of graphic display of **SID** procedure
3 Scale
4 Name of **SID** procedure
5 Name of RW
6 Name of transit point

Figure J.6.9

Overview of SID procedure

To overview **SID** procedure of an airport, perform the following operations:

a) set highlight to the field of airport identifier. Input identifier of airport, which **SID** procedure information it is required to overview;

b) press **ENT**. Highlight will move to **DEP** field (figure J.6.10);

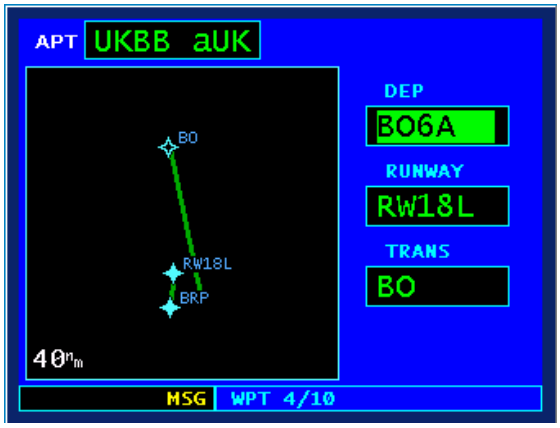


Figure J.6.10

c) turn internal knob one position further. **WPT4** page displays **DEP** pop-up window. Set highlight to name of the required procedure (figure J.6.11);

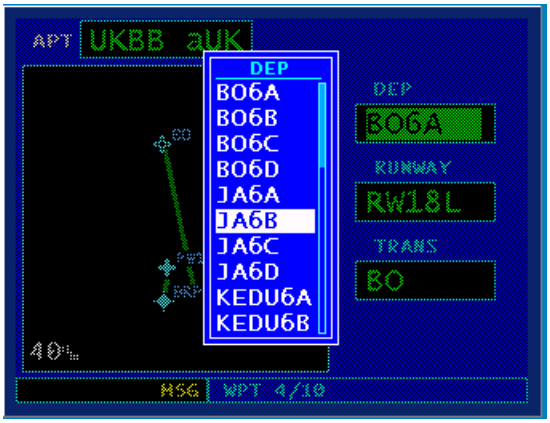


Figure J.6.11

d) press **ENT**. **DEP** field displays name of selected procedure. Highlight will move to the field of RW name **RUNWAY** (figure J.6.12);

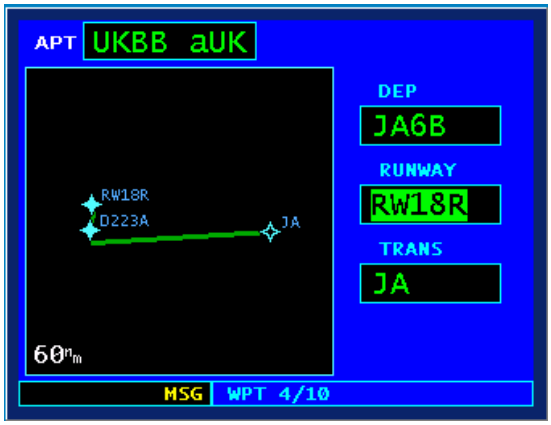


Figure J.6.12

e) turn internal knob one position further. **WPT4** page displays **RUNWAY** pop-up window (figure J.6.13);

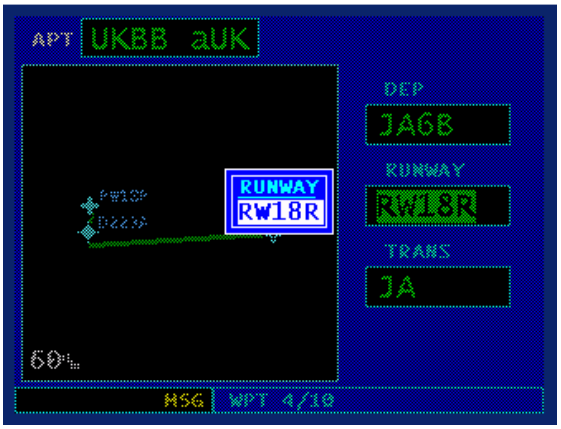


Figure J.6.13

f) set highlight to the name of required RW;

g) press **ENT**. **RUNWAY** field displays name of selected RW, and highlight will move to the field of transit point name **TRANS** (figure J.6.14);

Figure J.6.14

h) turn internal knob one position further. **WPT4** page displays **TRANS** pop-up window (figure J.6.15);

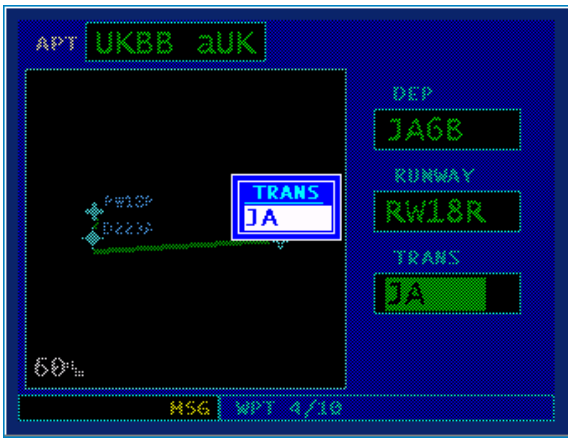


Figure J.6.15

i) set highlight to the name of required transit point;

j) press **ENT**. **TRANS** field displays name of selected transit point, highlight will remain in the field of transit point name. Graphic representation of selected procedure **SID** is displayed on the **WPT4** page in the filed of graphic representation of procedure;

k) press **CRSR** button. Highlight will disappear from the fields of WPT4 page (figure J.6.16).

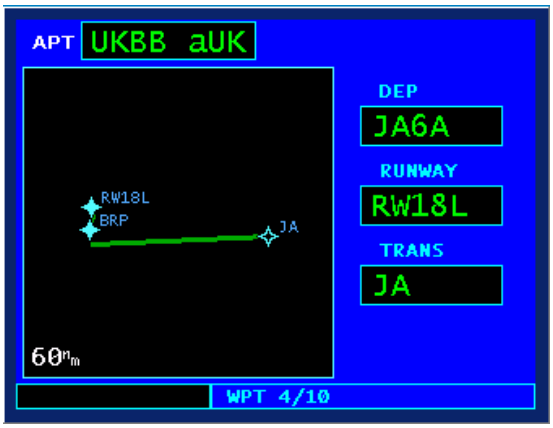


Figure J.6.16

Zoom of graphic display of SID procedure

To zoom graphic display of the procedure SID, perform the following operations:

a) press **MENU** button (figure J.6.17);

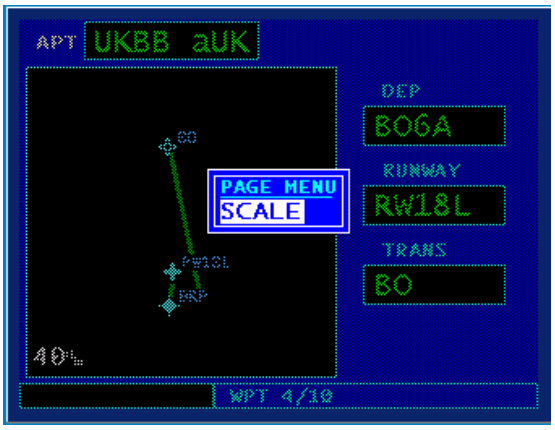


Figure J.6.17

b) press **ENT**. Symbol «+» will appear in the centre of the field of graphic display of **SID** procedure (figure J.6.18);

Figure J.6.18

c) rotating graphic display of **SID** procedure horizontally by means of external knob, and vertically – by means of internal knob, set graphic display of the procedure to symbol «+» in a place, which after zooming must be in the centre of the field of graphic display of the procedure;

d) press **RNG-** button, if it is necessary decrease the scale of display. To increase the scale of display, press **RNG+** button (figure J.6.19);

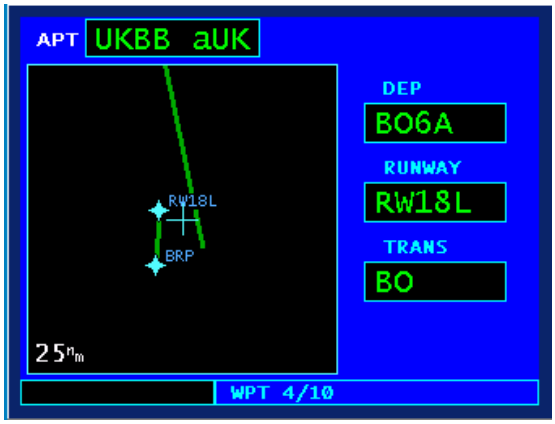


Figure J.6.19

e) press **CRSR** button to exit from zoom mode (figure J.6.20).

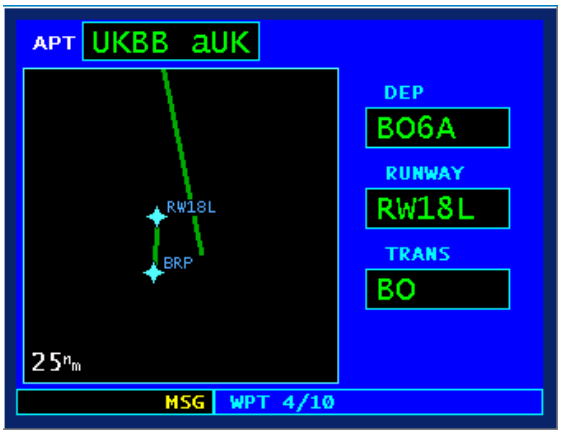
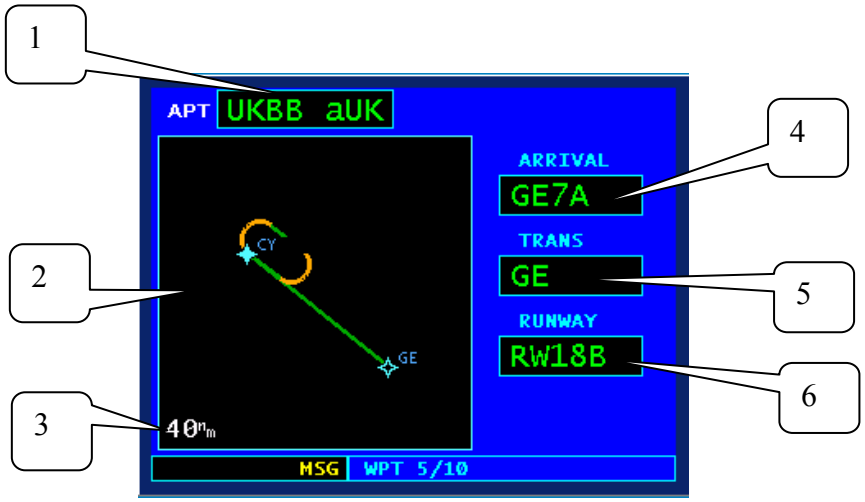


Figure J.6.20

WPT5 page

WPT5 page is used for oveview of **STAR** procedure.

View of **WPT5** page is shown in figure J.6.21.



1 Airport identifier
2 Field of graphic display of **STAR** procedure
3 Scale
4 Name of **STAR** current procedure
5 Name of transit point
6 RW name

Figure J.6.21

Overview of STAR procedure

To overview STAR procedure of an airport perform the following operations:

a) set highlight to the field of airport identifier. Input identifier of airport, which **STAR** procedure information it is required to overview;

b) press **ENT**. Highlight will move to **ARRIVAL** field (figure J.6.22);

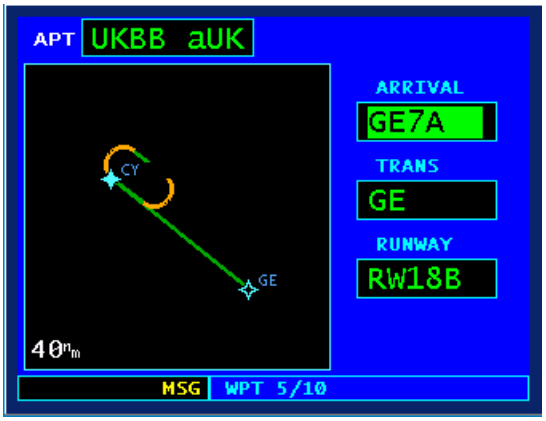


Figure J.6.22

c) turn internal knob one position further. **WPT5** page displays **ARRIVAL** pop-up window**.** Set highlight to the name of required **STAR** procedure (figure J.6.23);

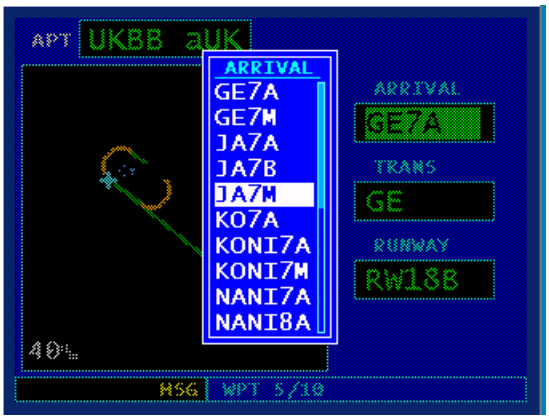


Figure J.6.23

d) press **ENT**. **ARRIVAL** field displays the name of selected **STAR** procedure. Highlight will move to the field of transit point name **TRANS** (figure J.6.24);

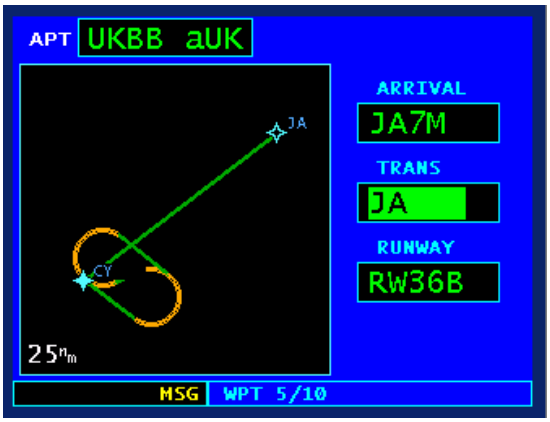


Figure J.6.24

e) turn internal knob one position further. **WPT5** page displays **TRANS** pop-up window (figure J.6.25);

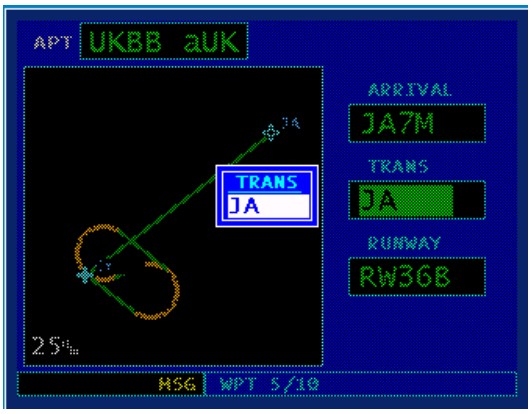


Figure J.6.25

e) set highlight to the name of required of transit point;

f) press **ENT**. **TRANS** field displays the name of selected transit point. Highlight will move to the field of RW name **RUNWAY** (figure J.6.26);

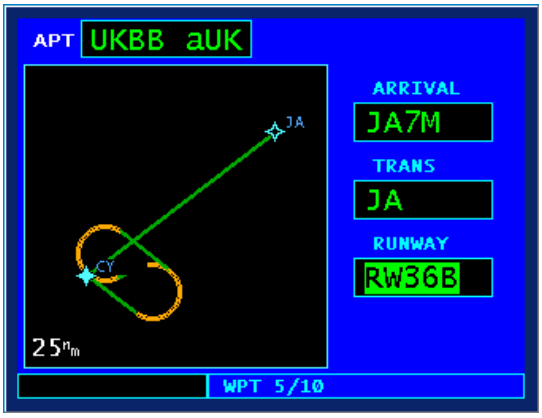


Figure J.6.26

g) turn internal knob one position further. **WPT5** page displays **RUNWAY** pop-up window (figure J.6.27);

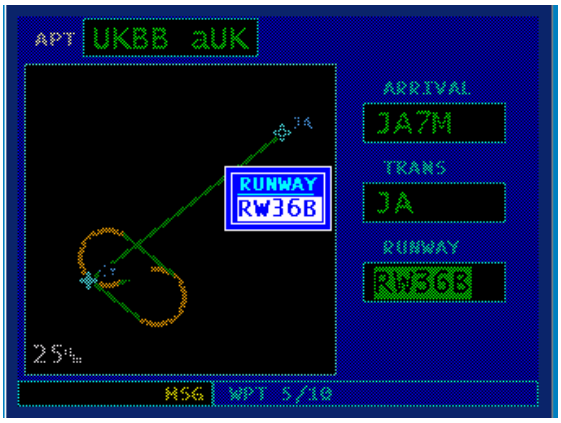


Figure J.6.27

h) set highlight to the name of required of RW;

i) press **ENT**. **RUNWAY** field displays the name of selected RW, highlight will remain in **RUNWAY** field. Graphic representation of selected procedure **STAR** is displayed on **WPT5** page in the filed of graphic representation of procedure;

j) press **CRSR** button. Highlight will disappear from the fields of **WPT5** page (figure J.6.28).

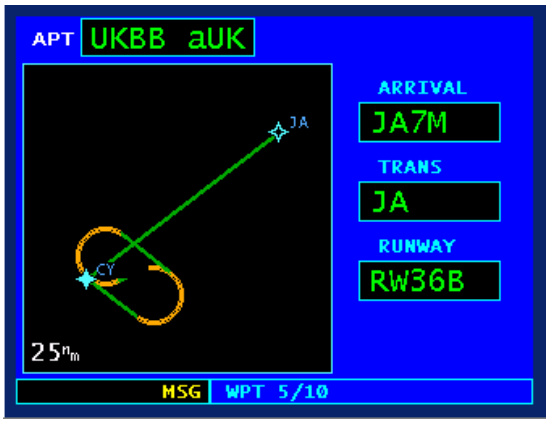


Figure J.6.28

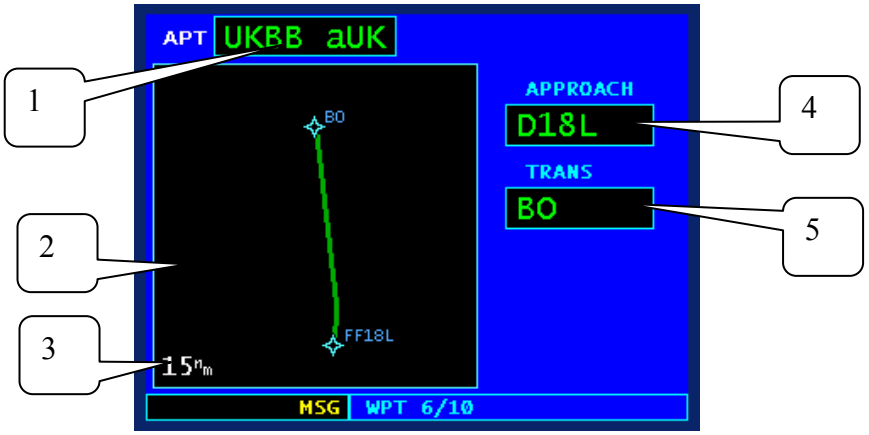
Zoom of graphic display of STAR procedure

Zoom of graphic display of **STAR** procedure is accomplished by analogy with zoom graphic display of **SID** procedure (see description of **WPT4** page).

WPT6 page

WPT6 page is used for oveview of **APPROACH** procedure.

View of **WPT6** page is shown in figure J.6.29.



1 Airport identifier
2 Field of graphic display of **APPROACH** procedure
3 Scale
4 Name of current **APPROACH** procedure
5 Name of transit point

Figure J.6.29

Overview of APPROACH procedure

To overview **APPROACH** procedures of an airport perform the following operations:

a) set highlight to the field of airport identifier. Input identifier of airport, which **APPROACH** procedure information it is necessary to overview;

b) press **ENT**. Highlight will move to the field of current **APPROACH** procedure (figure J.6.30);

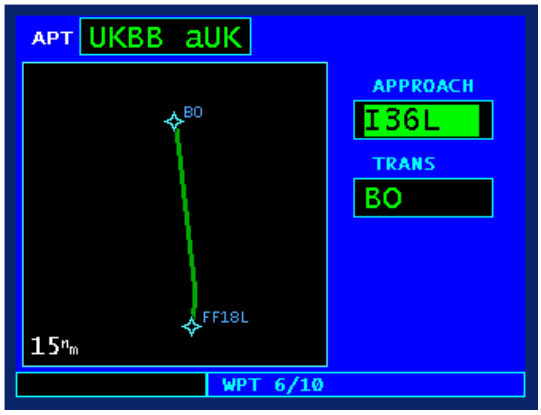


Figure J.6.30

c) turn internal knob one position further. **WPT6** page displays **APPROACH** window. Set highlight to the name of required procedure (figure J.6.31);

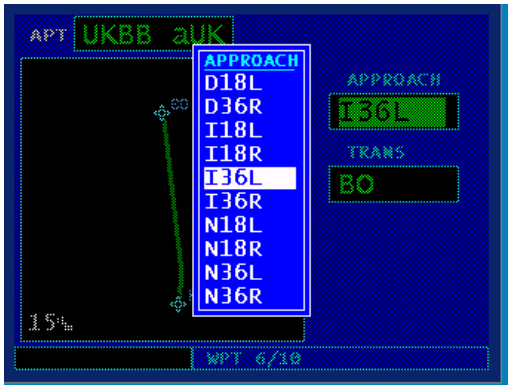


Figure J.6.31

d) press **ENT**. **APPROACH** field displays the name of selected procedure. Highlight will move to the field of transit point name (figure J.6.32);

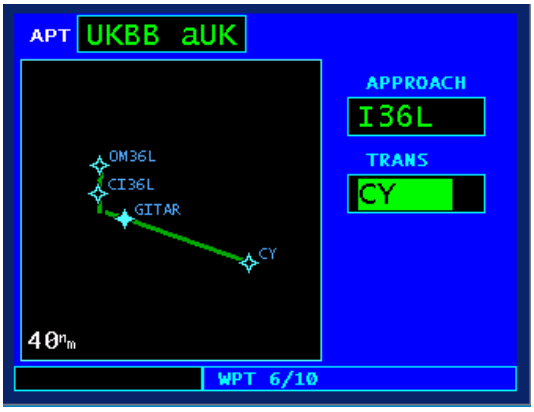


Figure J.6.32

e) turn internal knob one position further. **WPT6** page displays **TRANS** pop-up window. Set highlight to the name of required transit point (figure J.6.33);

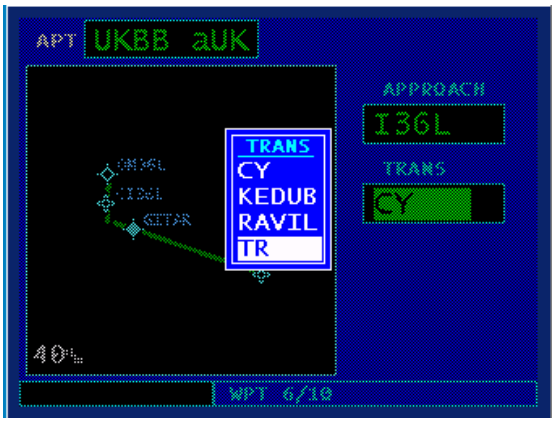


Figure J.6.33

f) press **ENT**. **TRANS** field displays the name of selected transit point, highlight will remain in **TRANS** field. Graphic representation of selected procedure **APPROACH** is displayed on **WPT6** page in the field of graphic representation of procedure;

g) press **CRSR** button. Highlight will disappear from the fields of **WPT6** page (figure J.6.34).

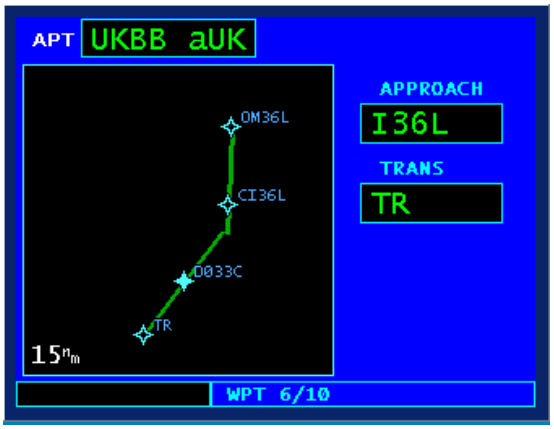


Figure J.6.34

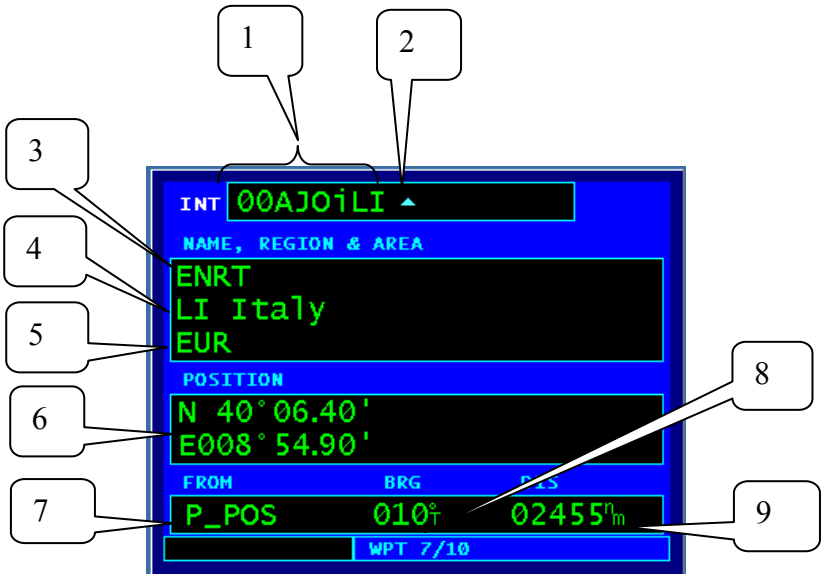
Zoom of graphic display of APPROACH procedure

Zoom of graphic display of **STAR** procedure is accomplished by analogy with zoom graphic display of **SID** procedure (see description of **WPT4** page).

WPT7 page

WPT7 page is used for oveview of information about NP of flight plan intersection point category (**Intersection**).

View of **WPT7** page is shown in figure J.6.35.



1 Identifier of flight plan intersection point (**Intersection**)
2 Reference designation of flight plan intersection point
3 Name of flight plan intersection point
4 Region of the country, where flight plan intersection point is located
5 Region of earth, where flight plan intersection point is located
6 Latitude, longitude of flight plan intersection point
7 Symbol of current position of AC
8 Bearing to flight plan intersection point from current position
9 Distance to flight plan intersection point from current position

Figure J.6.35

Overview of information about flight plan intersection point

Selection of flight plan intersection point for overview of information about it, is accomplished as follows:

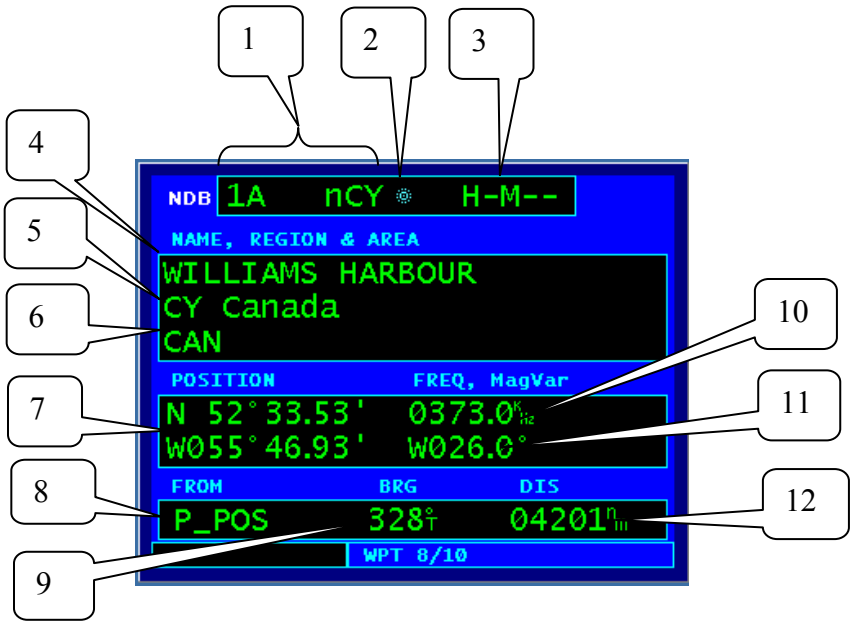
a) input identifier of flight plan intersection point, which information it is necessary to overview. If there are several flight plan intersection points, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located;

b) press **ENT**, **WPT7** page displays information about flight plan intersection point with input identifier.

WPT8 page

WPT8 page overview of information of NP of nondirectional beacons category (**NDB**).

View of **WPT8** page is shown in figure J.6.36.



1 Identifier of nondirectional beacon (**NDB**)
2 Reference designation of nondirectional beacon
3 Class of **NAVAID** means
4 Name of nondirectional beacon
5 Region of the country, where nondirectional beacon is located
6 Region of earth, where nondirectional beacon is located
7 Latitude, longitude of nondirectional beacon
8 Symbol of current position of AC
9 Bearing to nondirectional beacon from current position
10 Frequency of nondirectional beacon
11 Magnetic declination
12 Distance to nondirectional beacon from current position

Figure J.6.36

Class of **L/MF NAVAID** means is shown in table J.6.1.

Table J.6.1

Means L/MF NAVAID	Decade in the field of display of class of NAVAID means				
	1	2	3	4	5
NDB	H				
SABH	S				
Sea beacon	M				
Internal marker		I			
Middle marker		M			
External marker		O			
Marker of reverse course		C			
Transmitter power 2000 watt or more			H		
Transmitter power 25 – 50 watt			M		
Transmitter power less than 25 watt			L		
Automatic weather forecast				A	
Planned weather forecast				B	
Speech is not available on NAVAID				W	
Required work of BFO					B

Overview of information about NP of nondirectional beacons

Selection of NP of nondirectional beacons category for overview of information about it, is accomplished as follows:

a) input identifier (name) of NP of nondirectional beacons category, which information it is necessary to overview. If the are several NP of nondirectional beacons category, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located (figure J.6.37);

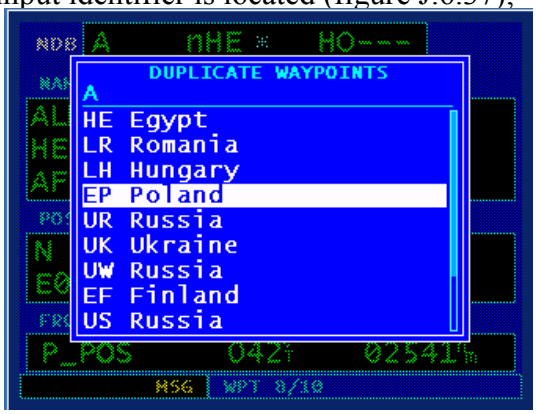


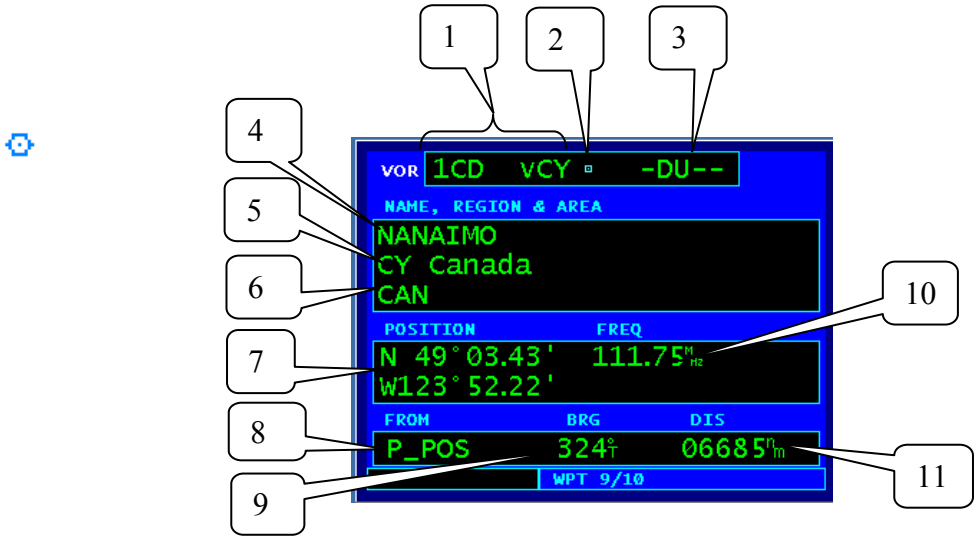
Figure J.6.37

b) press **ENT**, **WPT8** page displays information about NP of nondirectional beacons category with input identifier (name).

WPT9 page

WPT9 page is used to overview information about NP of omnidirectional USW-beacons category (**VOR**).

View of **WPT9** page is shown in figure J.6.38.



1 Identifier of omnidirectional USW-beacon (**VOR**)

2 Reference designation of omnidirectional USW-beacon:

- VOR;
- VOR/DME;
- VORTAC;
- TACAN;
- DME

3 Class of **NAVAID** means
4 Name of omnidirectional USW-beacon
5 Region of the country, where omnidirectional USW-beacon is located
6 Region of earth, where omnidirectional USW-beacon is located
7 Latitude, longitude of nondirectional beacon
8 Symbol of current position of AC
9 Bearing to omnidirectional USW-beacon from current position
10 Frequency of omnidirectional USW-beacon
11 Distance to omnidirectional USW-beacon from current position

Figure J.6.38

Class of **VHF NAVAID** means is shown in figure J.6.2, J.6.3.

Table J.6.2

VHF NAVAID	**Decade in the field of display of class of NAVAID means**				
	1	**2**	**3**	**4**	**5**
VOR	V				
TACAN (channels 17-59 и 70-126)		T			
TACAN (channels 1-16 и 60-69)		M			
DME		D			

Table J.6.3

VHF NAVAID	**Decade in the field of display of class of NAVAID means**				
	1	**2**	**3**	**4**	**5**
ILS/DME ILS/TACAN		I			
MLS DME/N		N			
MLS DME/P		P			
Airfield			T		
Small altitude			L		
Big altitude			H		
Unlimited			U		
TACAN part from ILS TACAN			C		
Displaced ILS/DME or ILS/TACAN				D	
Automatic weather forecast				A	
Planned weather forecast				B	
Speech is not available on NAVAID				W	
Nonconcentrated VOR and TACAN or DME				N	

Overview of information about NP of omnidirectional USW-beacons

Selection of NP of omnidirectional USW-beacons category for overview of information about it, is accomplished as follows:

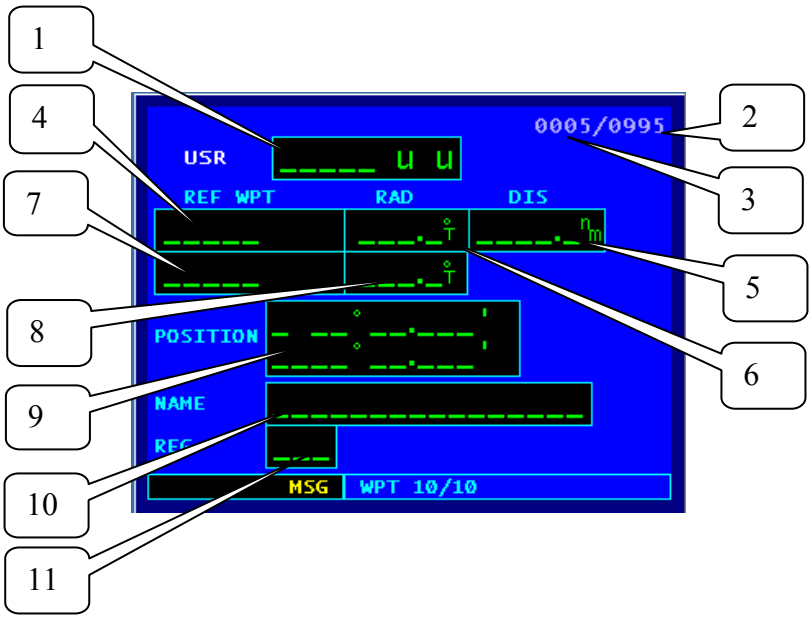
a) input identifier (name) of NP of omnidirectional USW-beacons category, which information it is necessary to overview. If the are several NP of omnidirectional USW-beacons category with input identifier, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located;

b) press **ENT**, **WPT9** page displays information about NP of omnidirectional USW-beacons category with input identifier (name) **WPT9** .

WPT10 page

WPT10 page is used for overview of information, editing and creation of NP of User WP category (**User WP**).

View of **WPT10** page is shown in figure J.6.39.



1 Identifier of NP of User WP category (**User WP**)
2 Number of user WP possible for creating
3 Number of created user WP
4 Identifier of basic NP
5 Distance from basic NP
6 Bearing from basic NP
7 Identifier of the second basic NP
8 Bearing from second basic NP
9 Latitude, longitude of user WP
10 Name of user WP
11 Region

Figure J.6.39

Creation of user WP

Creation of user WP is accomplished by input of identifier of a new user WP and by setting:

- coordinates of user WP being created;
- bearing and distance from basic NP;
- bearings from two basic NP.

N o t e s

1 Input identifier of forming user point should not contain spaces on the first character cell and in the middle of identifier.

2 If after input of identifier of user WP being created, right lower angle of WPT10 page displays the message:

*- **Modify?**, then user WP with such identifier exists, and it can be edited;*

*- **used**, then user WP with such identifier is the waypoint created in pages of FPL form, and it cannot be edited.*

Creation of user WP by setting coordinates

To create user WP by setting coordinates:

a) set highlight in the field of display of NP identifier;

b) input identifier of user WP being created;

c) press **ENT** button to confirm input of identifier. Highlight will move to the field of identifier of basic NP. Request about creation of user WP **Create?** will appear in right lower angle (figure J.6.40);

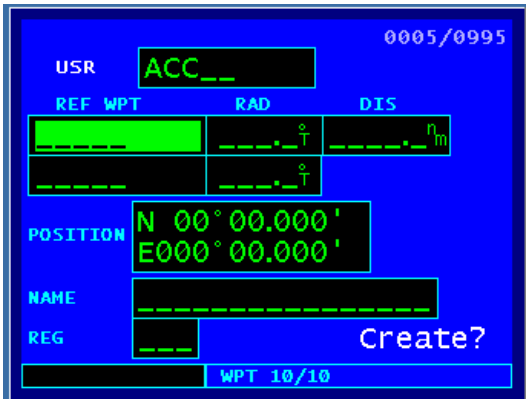


Figure J.6.40

d) set highlight to the coordinates field by pressing **ENT** or by rotating external knob clockwise;

e) set the required value of coordinates;

f) press **ENT** to confirm input of coordinates. Highlight will move to the field of NP name;

g) input name of NP and region if necessary;

h) set highlight to **Create?** field (figure J.6.41);

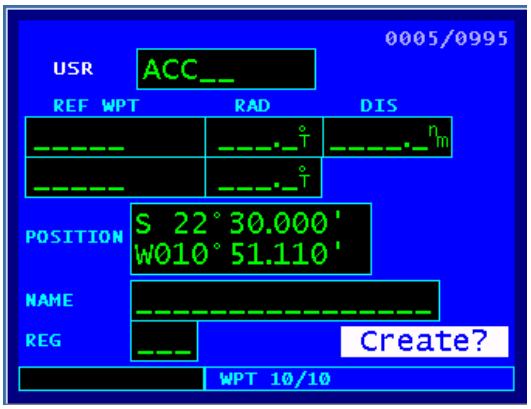


Figure J.6.41

i) press **ENT** to confirm creation of user NP. Number of created NP will increase by one unit in the field of created user NP number, and number of NP possible for creating will decrease by one unit in the field of number of NP possible for creating (figure J.6.42). Highlight will move to the field of identifier of user NP and request about change of user NP **Modify?** will appear;

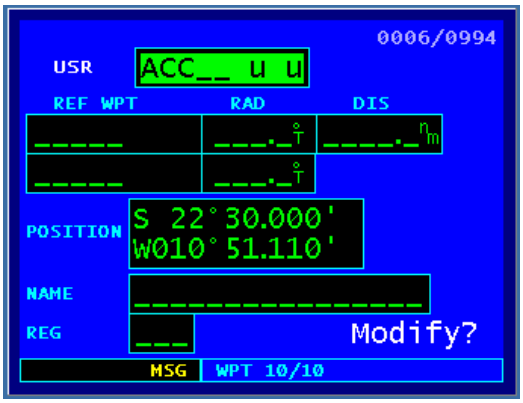


Figure J.6.42

j) press **CRSR** button to exit from user NP creation mode.

Creation of user WP by setting bearing and distance from basic NP

To create user NP by setting bearing and distance from basic NP:

a) set highlight to the field of display of NP identifier;

b) input identifier of user NP being created;

c) press **ENT** to confirm input of identifier. A request about creation of user WP **Create?** will appear in right lower angle of RICU display. Highlight will move to the field of identifier of basic NP;

d) input identifier of basic NP (if there are several NP with input identifier, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located. Set highlight to required region of NP). Press **ENT**. Bearing and distance from input basic NP to the point with coordinates, displayed in **POSITION** field**,** are displayed on **WPT10** page in the fields **RAD** and **DIS**. Highlight will move to the field of bearing from basic NP (figure J.6.43);

Note – *To input current position of AC as basic NP, set highlight to the field of identifier of basic NP and press* ***CLR*** *button.* *Symbol of current position of AC* ***P_POS*** *is displayed in the field of identifier of basic NP.*

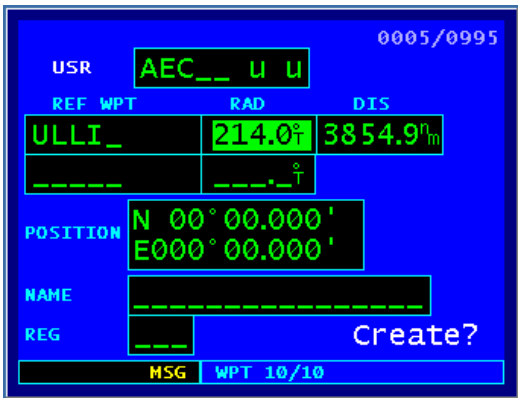


Figure J.6.43

e) set value of bearing;

f) press **ENT**. Highlight will move to the field of distance to basic NP. Values of coordinates being displayed in **POSITION** field, will change (figure J.6.44);

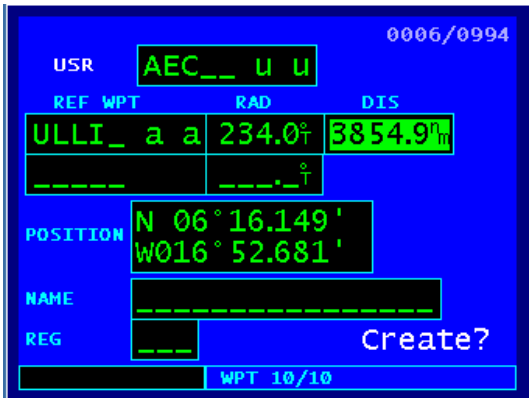


Figure J.6.44

g) set distance from NP being created to basic NP;

h) press **ENT**. Coordinates of user NP, created by setting bearing and distance from basic NP are displayed in **POSITION** field (figure J.6.45);

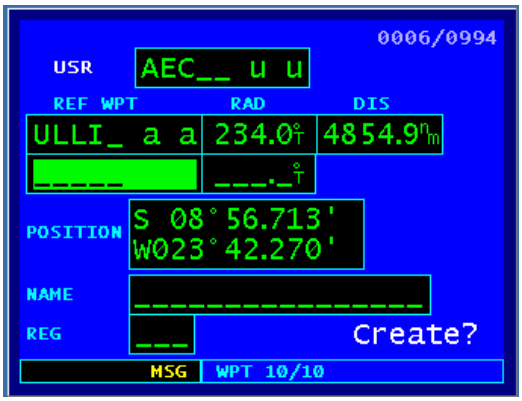


Figure J.6.45

i) set highlight to the field **Create?**;

j) press ENT to confirm the creation of user NP. NP with input identifier and coordinates, displayed in the field **POSITION**, is created.

Creation of user WP by setting bearing from two basic NP

To create user NP by setting bearing from two basic NP:

a) set highlight to the field of display of NP identifier;

b) input identifier of user NP being created;

c) press **ENT** to confirm input of identifier. Highlight will move to the field of identifier of basic NP. A request about creation of user WP **Create?** will appear in right lower angle of RICU display;

d) input identifier of basic NP (if there are several NP with input identifier, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located. Set highlight to required region of NP). Press **ENT**. Bearing and distance from input basic NP to the point with coordinates, displayed in **POSITION** field**,** are displayed on **WPT10** page in **RAD** and **DIS** fields;

e) press **ENT**. Highlight will move to the field of bearing to basic NP. Set bearing value, press **ENT**;

f) move highlight to the field of the second basic NP. Input identifier of the second basic NP (if there are several NP with input identifier, then RICU will display **DUPLICATE WAYPOINTS** pop-up window for selection of region, where the point with input identifier is located. Set highlight to required region of NP);

g) press **ENT**. Values of coordinates, displayed in **POSITION** field, will change. Highlight will move to the field of bearing to the second basic NP;

h) set bearing value. Press **ENT**. Coordinates of user NP, created by setting bearings from two basic NP are displayed in **POSITION** field;

i) set highlight to the field **Create?** by pressing **ENT** or by rotating external knob clockwise;

j) press **ENT** to confirm the creation of user NP. User NP with input identifier and coordinates, displayed in **POSITION** field, is created.

Overview of information about user NP

To overview information about user NP:

a) set highlight to the field of display of NP identifier;

b) input identifier of user NP, which information it is necessary to overview. Information about NP with input identifier is displayed in the fields of **WPT10** page.

Editing of user NP

To edit user NP:

a) set highlight to the field of display of NP identifier;

b) input identifier of user NP, which information it is necessary to edit. Information about NP with input identifier is displayed in the fields of **WPT10** page;

Note – *If user NP with input identifier is used at least in one of the flight plans created on the pages of **FPL** form (message used is displayed in right lower angle), it is impossible to edit it.*

c) press **ENT**;

d) set highlight to the field of user NP parameter, which value it is necessary to change;

e) set a new value of parameter;

f) set highlight to the field of enquiry about change of user NP **Modify?**;

g) press **ENT** to confirm change of parameter.

Operations performed on WPT10 page when pressing MENU button

PAGE MENU pop-up window is displayed on **WPT10** page when pressing **MENU** button (figure J.6.46), its fields are used to perform the following operations:

- overview of user NP list (**View User Waypoint List?** field);
- deletion of user NP (**Delete User Waypoint?** field);

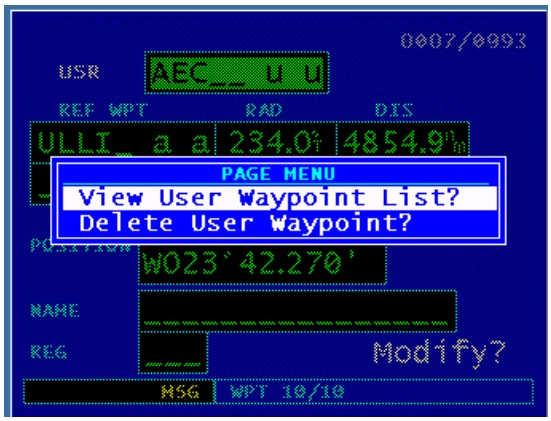


Figure J.6.46

Deletion of user NP

To delete user NP:

a) set highlight to the field of display of NP identifier;

b) input identifier of user NP, which must be deleted;

c) press **MENU** button. **PAGE MENU** window will appear on **WPT10** page (figure J.6.46);

d) set highlight to **Delete User Waypoint?** field

e) press **ENT**;

f) if user NP selected for deletion is used in none of flight plans, created on the pages of **FPL** form, **DELETE WAYPOINT?** window with enquiry about deletion of selected NP will appear on **WPT10** page (figure J.6.47). In this case:

- set highlight to **Yes** field;
- press **ENT** to confirm deletion. Selected NP will be deleted from user NP list, **WPT10** page will be displayed on RICU (figure J.6.39);

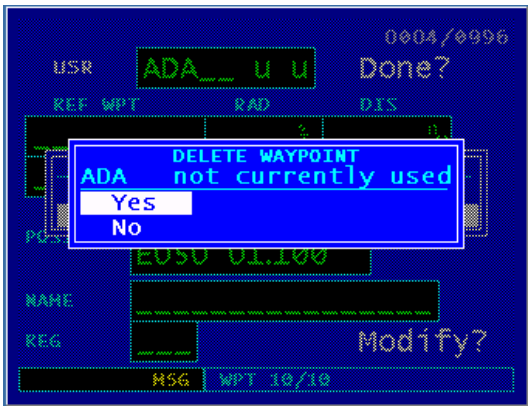


Figure J.6.47

g) If user NP with selected for deletion is used at least in one of the flight plans created on the pages of **FPL** form, **DELETE WAYPOINT?** window with the message stating that selected navigation point can not be deleted, will appear on **WPT10** page (figure J.6.48). Press **ENT** to refuse deletion. Selected user NP will not be deleted from user NP list.

Figure J.6.48

Overview of user NP list

To overview user NP list:

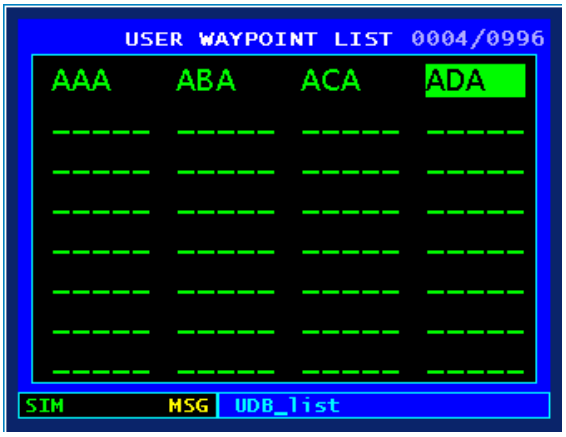
a) press **MENU** button. **PAGE MENU** window will appear on **WPT10** page (figure J.6.46);

b) set highlight to **View User Waypoint List?** field

c) press **ENT**. **UDB_list** window will appear on RICU display (figure J.6.49).

Description of UDB_list window

List of user points in alphabetical order of symbols is displayed in **UDB_list** window.



Selection of user NP for overview

To select NP for overview:

a) set highlight to identifier of NP, information of which is required to overview (figure J.6.49);

b) press **ENT**. **WPT10** page with information about selected NP is displayed on RICU. Highlighted **Done?** message will appear in right upper angle (figure J.6.50). Return to **UDB_list** window is accomplished by pressing **ENT** with highlighted **Done?**.message.

Note - ***Done?*** *message will be displayed on* ***WPT10*** *page,* *until return from* ***UDB_list*** *window by pressing* ***CRSR*** *button is accomplished.*

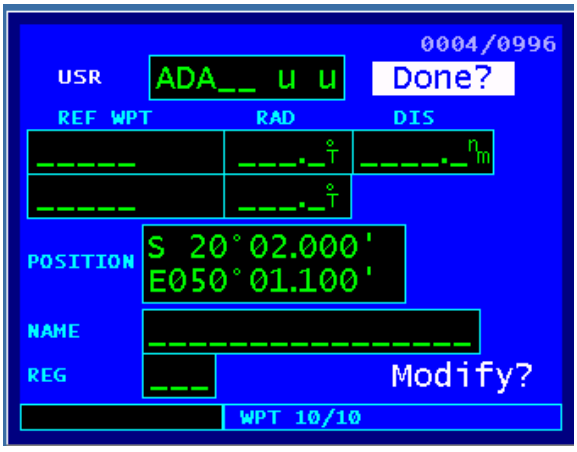


Figure J.6.50

Deletion of user NP

To delete user NP:

a) set highlight to identifier of NP, which must be deleted (figure 6.49);

b) press **CLR** button;

c) If user NP with selected for deletion is used in none of the flight plans created on the pages of **FPL** form, **DELETE WAYPOINT?** window containing the request about deletion of selected NP will appear in the window **UDB_list** (figure J.6.51). In this case:

- set highlight to **Yes** field;
- press **ENT** to confirm deletion. Selected NP will not be deleted from user NP list;

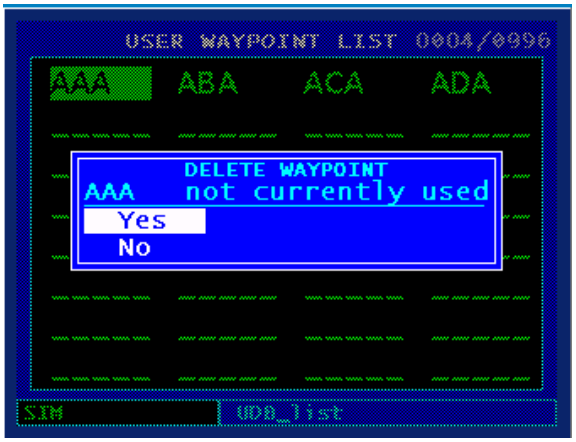


Figure J.6.51

d) If user NP with selected for deletion is used at least in one of the flight plans created on the pages of **FPL** form, **DELETE WAYPOINT?** window containing the message stating that selected navigation point can not be deleted, will appear in **UDB_list** window (figure J.6.52). Press **ENT** to refuse deletion. Selected NP will not be deleted from user NP list.

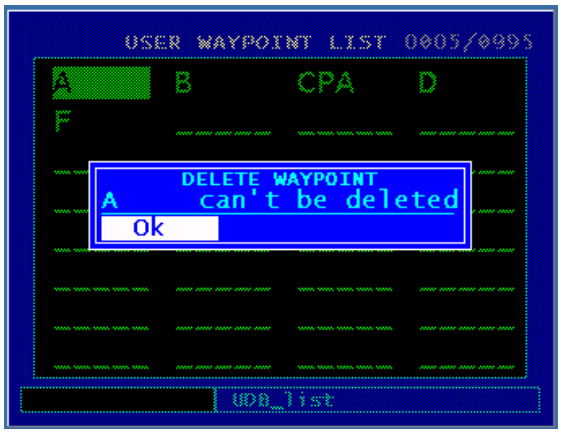


Figure 6.52

Renaming of user NP

To rename user NP:

a) set highlight to identifier of NP, which must be renamed (figure 6.49);

b) input a new identifier of NP. Press **ENT**;

c) if there is no user point with identifier, which was input as new one, in user NP list, **RENAME WAYPOINT** pop-up window with identifier of NP, which must be renamed, will appear in **UDB_list** window (figure J.6.53). Press **ENT** when **YES** field is highlighted. User NP will be renamed and will take its place in the list according to alphabet;

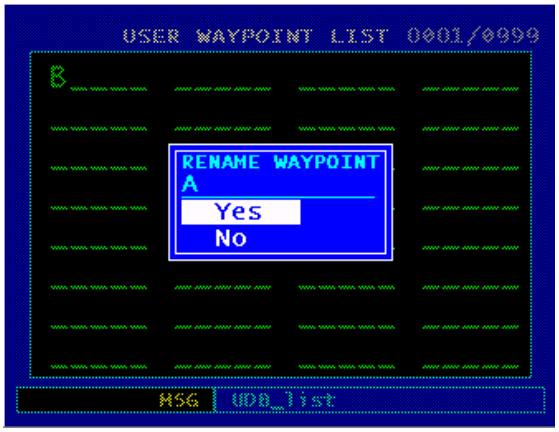


Figure J.6.53

d) if user NP with identifier, which was input as new one, already exists in user NP list, renaming will not be accomplished. **UDB_list** window will display **Waypoint exists! FIND?** pop-up window (figure J.6.54) offering to find existing user NP with identifier which was input as new one. By pressing **ENT** when the field **YES** is highlighted:

- **Yes** – identifier of NP already existing will be highlighted;
- **No -** identifier of the point, standing in user NP list after the point which had to be renamed, will be highlighted.

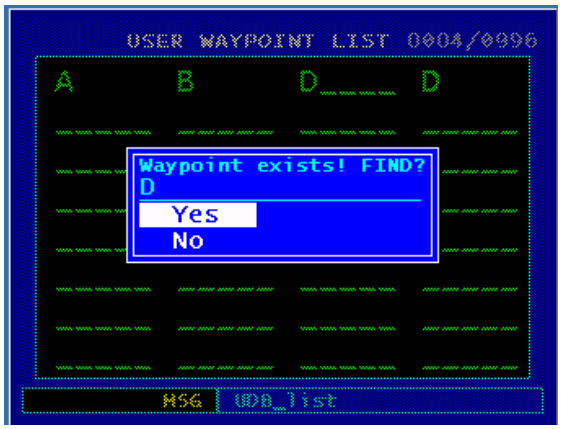


Figure J.6.54

Deletion of all user NP from UDB_list window by pressing MENU window

To delete all user NP:

a) press **MENU** button, RICU display will show **PAGE MENU** pop-up window (figure J.6.55);

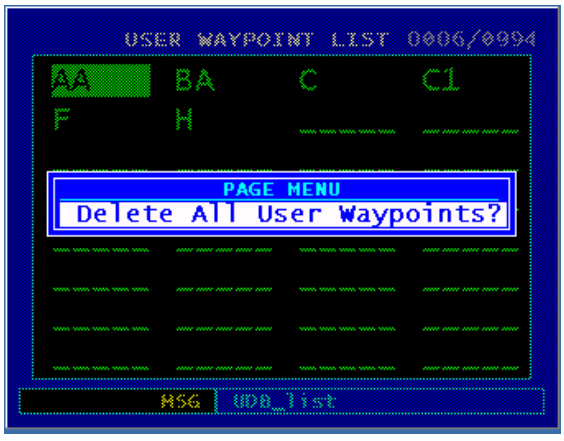


Figure J.6.55

b) press **ENT** button, RICU display will show **DELETE ALL WAYPOINT** pop-up window containing a request to delete all user NP (figure J.6.56);

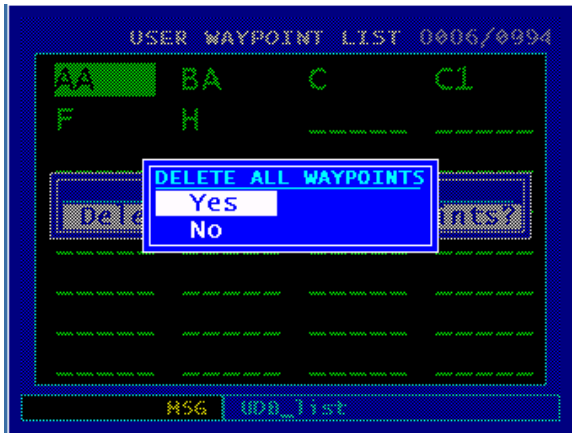


Figure J.6.56

c) set highlight to **Yes** field and press **ENT** button to confirm deletion. All user NP, which are not used at least in one of flight plans, created on the pages of **FPL** form, will be deleted from the list. RICU display will show **WPT10** page.

J.7 Operation description in NRST form

NRST form is used to overview information about nearest navigation points. Bearing and distance from current position to nearest navigation points are displayed in this form.

NRST form contains 4 pages:

– **NRST1** page (**NEAREST ARP**) is used to overview nearest NP of airport category;

– **NRST2** page (**NEAREST INTERSECTION**) is used to overview nearest NP of flight plans intersection points category;

– **NRST3** page (**NEAREST NDB**) is used to overview nearest NP of nondirectional radio beacons category;

– **NRST4** page (**NEAREST VOR**) is used to overview nearest NP of omnidirectional USW-beacons category.

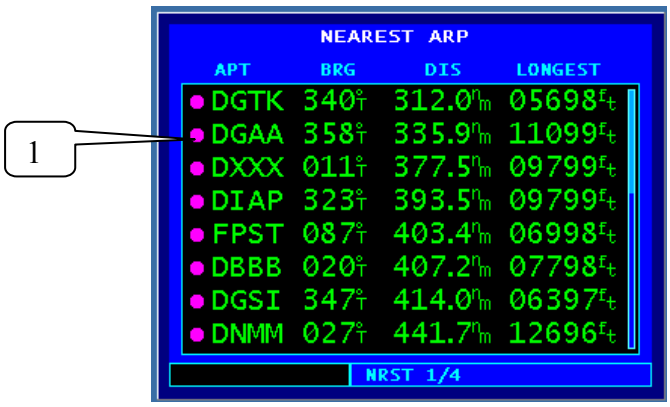
Entry to **NRST** form is accomplished by pressing **NRST** button on RICU.

In case of repeated pressing **NRST** button**,** RICU display shows the form, which was on RICU prior to activation of **NRST** form. Switching of pages of **NRST** form is accomplished by rotating internal knob.

NRST1 page

NRST1 (**NEAREST ARP**) page is used to overview nearest NP of airport category.

View of **NRST1** page is shown in figure J.7.1.



1 Lines of table with parameters:
- Reference designation of parameter;
- Airport identifier;
- Bearing to airport from current position;
- Distance to airport from current position;
- Length of the longest RW of airport

Figure J.7.1

Overview of information about nearest NP of airport category

To overview information about nearest NP of airport category, perform the following operations:

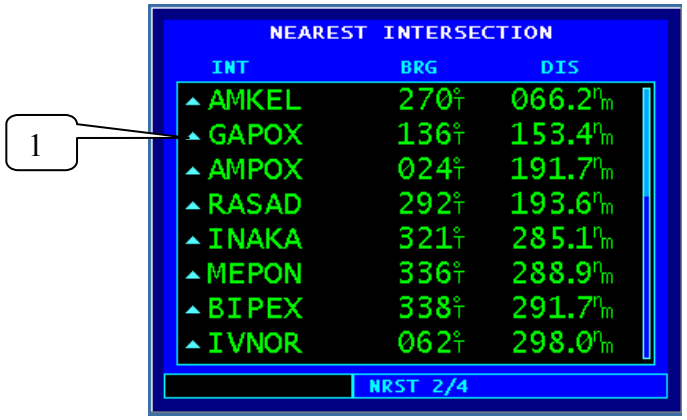
a) press **CRSR** button, first line of the table will become highlighted;

b) by rotating external knob clockwise, move highlight through lines of the table until the last line. When rotating external knob anticlockwise, highlight will move through lines to the upper line of the table.

NRST2 page

NRST2 (**NEAREST INTERSECTION**) page is used to overview nearest NP of flight plans intersection points category.

View of **NRST2** page is shown in figure J.7.2.



1 Lines of table with parameters:
- Reference designation of flight plans intersection point;
- Identifier of flight plans intersection points;
- Bearing to flight plans intersection point from current position;
- Distance to flight plans intersection point from current position.

Figure J.7.2

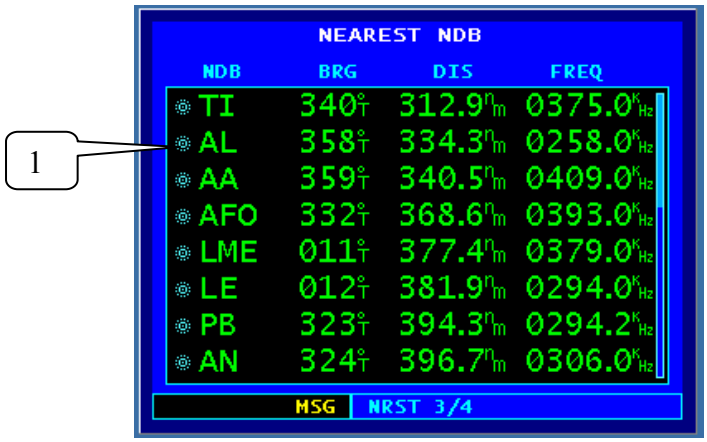
Overview of information about nearest NP of flight plans intersection points category

Overview of information about nearest NP of flight plans intersection points category is accomplished by analogy with overview of information about nearest NP of airport category, **NRST1**page.

NRST3 page

NRST3 (**NEAREST NDB**) page is used to overview nearest NP of nondirectional radio beacons category.

View of **NRST3** page is shown in figure J.7.3.



1 Lines of table with parameters:

- Reference designation of nondirectional radio beacon;
- Identifier of nondirectional radio beacon;
- Bearing to nondirectional radio beacon from current position;
- Distance to nondirectional radio beacon from current position;
- Frequency

Figure J.7.3

Overview of information about nearest NP of nondirectional radio beacons category

Overview of information about nearest NP of nondirectional radio beacons category is accomplished by analogy with overview of information about nearest NP of airport category, **NRST1** page.

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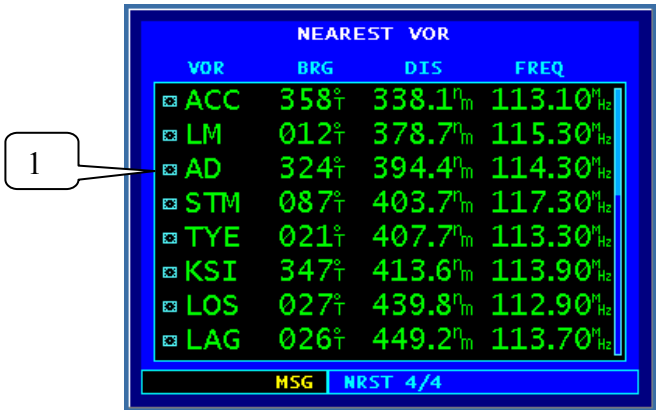
NRST4 page

NRST4 (**NEAREST VOR**) page is used to overview nearest NP of omnidirectional USW-beacons category.

View of **NRST4** page is shown in figure J.7.4.



1 Lines of table with parameters:
- Reference designation of omnidirectional USW-beacon;
- Identifier of omnidirectional USW-beacon;
- Bearing to omnidirectional USW-beacon from current position;
- Distance to omnidirectional USW-beacon from current position;
- Frequency

Figure J.7.4

Overview of information about nearest NP of omnidirectional USW-beacons category

Overview of information about nearest NP of omnidirectional USW-beacons category is accomplished by analogy with overview of information about nearest NP of airport category, **NRST1** page.

J.8 Operation description in AUX form

AUX form is used to set parameters and activate manoeuvres, to overview the information from navigation beacons, to setup values of system parameters and to test equipment.

The form includes 4 pages:

a) **AUX1** page is used to select manoeuvres of the flight;

b) **AUX2** page is used to overview information from navigation beacons;

c) **AUX3** page is used to setup values of system parameters;

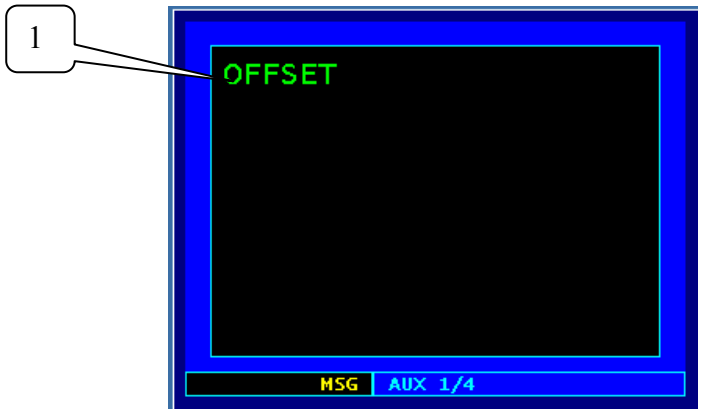
d) **AUX4** page is used to test equipment.

Entry to **AUX** form is accomplished by pressing **AUX** button on RICU. By repeated pressing **AUX** button**,** RICU display will show the form, which was displayed prior to activation of **AUX** form. Switching of pages of **AUX** form is accomplished by rotating internal knob.

AUX1 page

AUX1 page is used to select maneuvres of the flight.

View of **AUX1** page is shown in figure J.8.1.

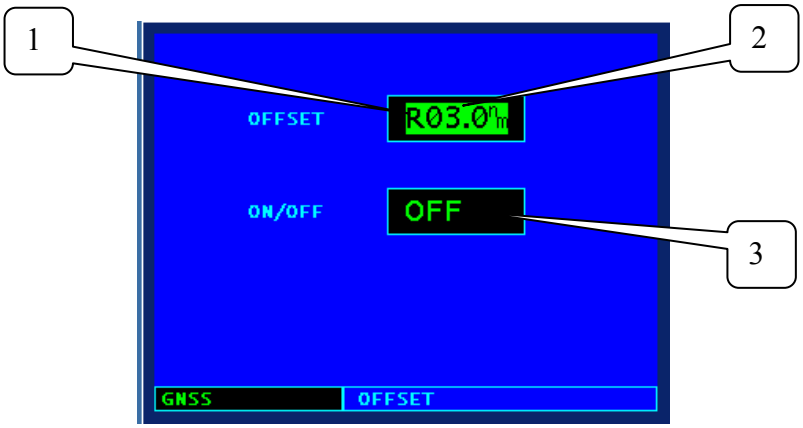


1 The field of activation of the window of flight maneuvres setting

Figure J.8.1

OFFSET field

OFFSET field is used to activate **OFFSET** window. Set highlight to **OFFSET** field and press **ENT**. To return to **AUX1** page**,** press **CLR** button. View of **OFFSET** page is shown in figure J.8.2.



1 Direction of displacement:
- R - displacement to the right;
- L - displacement to the left

2 Displacement value. Maximum displacement value is 99,9 km or 53,9 m.m.
3 Activation/deactivation of the flight on parallel flight plan

Figure J.8.2

OFFSET window is used to set parameters and activate the flight on parallel flight plan (flight with displacement).

Setting the flight on parallel flight plan is possible provided the following conditions:
- availability of active flight plan (except the flight in **DIRECT TO** and **OBS** mode);
- active step is not a part of standard procedure **SID**, **STAR** and **APPROACH**.

Mode of the flight with displacement starts immediately after activation of the flight on parallel flight plan. Movement to displaced flight plan is accomplished at an angle of 45 degrees. Flight cessation on parallel flight plan is accomplished:
- by operator instruction, if moving to the next step it is necessary to accomplish a turn at an angle of less than 130 degrees;
- automatically, if moving to the next step it is necessary to accomplish a turn at an angle of more than 130 degrees.

Setting the flight on parallel flight plan

To set flight on parallel flight plan it is necessary to accomplish the following actions:

a) set highlight to the field of direction an value of displacement and input direction an value of displacement;

b) set highlight to the field of activation/deactivation of the flight on parallel flight plan;

c) turn internal knob one position further, **SELECT** pop-up window is displayed in **OFFSET** window (figure J.8.3);

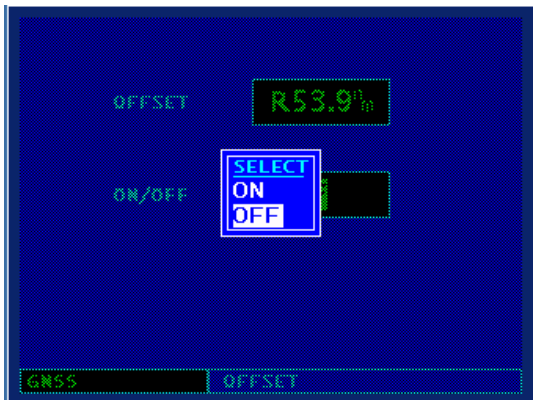


Figure J.8.3

d) set highlight to **ON** field. Press **ENT**, message about flight on parallel flight plan - **OFFSET** is displayed on RICU in status line (figure J.8.4).

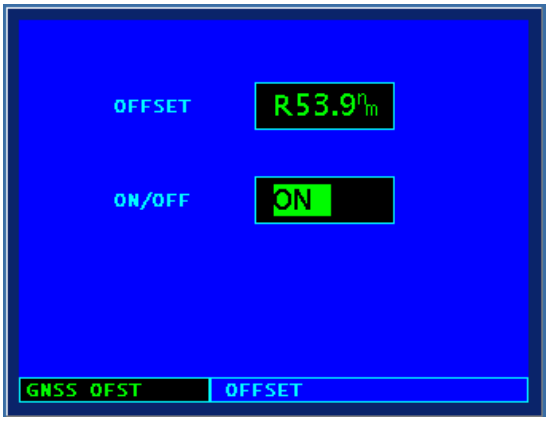
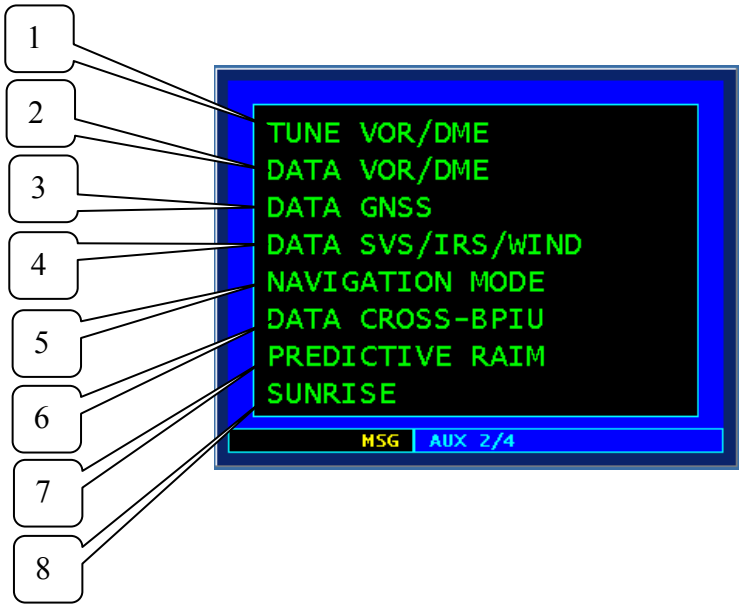


Figure J.8.4

AUX2 page

View of **AUX2** page is shown in figure J.8.5.



1 Adjustment VOR/DME
2 Data from VOR/DME
3 Data of sensor GNSS
4 Data of sensors SVS, IRS, wind computation
5 Navigation solution mode selection
6 Data about other RICU
7 Computation of RAIM forecast
8 Computation of sunrise and sunset time.

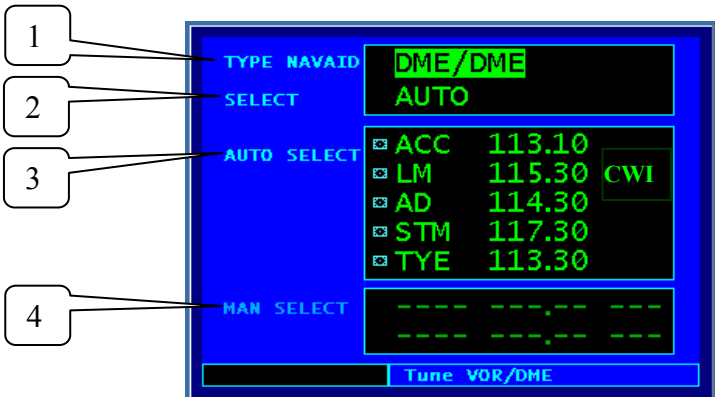
Figure J.8.5

TUNE VOR/DME field

TUNE VOR/DME field is used to activate the window **Tune VOR/DME**, intended for selection of beacons **VOR**, **DME**.

To activate **Tune VOR/DME** window**,** set highlight to **TUNE VOR/DME** field and press **ENT**. To return to **AUX2** page**,** press **CLR** button.

View of **Tune VOR/DME** window is shown in figure J.8.6.



1 Type of beacons
2 Mode of beacon type
3 List of beacons (for adjustment of AE) selected in automatic mode:
- reference designation of the beacon;
- identifier;
- frequency, MHz;
- **T** – received data from beacon (distance and azimuth);
- **C**- received text from airborne equipment **VOR/DME;**
- **W** – beacon is involved into navigation solution;
- **I** – distance to the beacon is indicated on the airplane distance indicator (set by operator)

4 List of beacons (for adjustment of AE) selected manually (information in the list is similar to pos.3)

Figure J.8.6

Review of beacons, involved in NT solution of selected type

For review of beacons:

a) set highlight to the field of beacons type;

b) turn internal knob one position further, **TYPE NAVAID** pop-up window is displayed in **Tune VOR/DME** window (figure J.8.7);

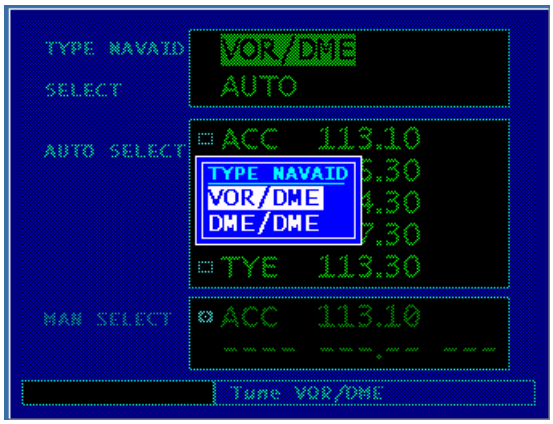


Figure J.8.7

c) set highlight to the indication field of the required type beacon. Press **ENT**. On RICU display in the beacon type field the beacons selected type shall be indicated; and in **AUTO SELECT** and **MAN SELECT** fields - selected type beacons list, involved in NT solution.

Task of beacons selection mode

The equipment supports three modes of beacons selection:

- **AUTO**;
- **MANUAL**;
- **TEST (CTRL)**.

During activation the equipment is always in the beacons selection automatic mode.

In **AUTO** mode the first five beacons are automatically selected from the nearest beacons list, corresponding to conditions as follows:

- for beacons with **T class** (Terminal) the beacons' coverage is given on Fig. J.8.8, J.8.9.

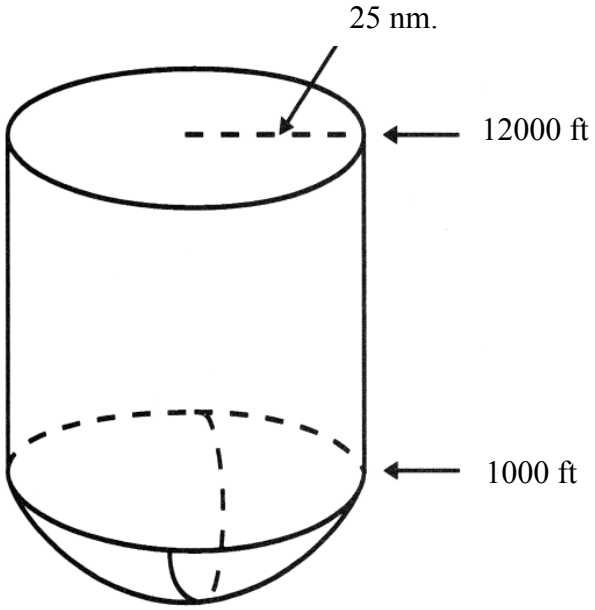


Figure J.8.8

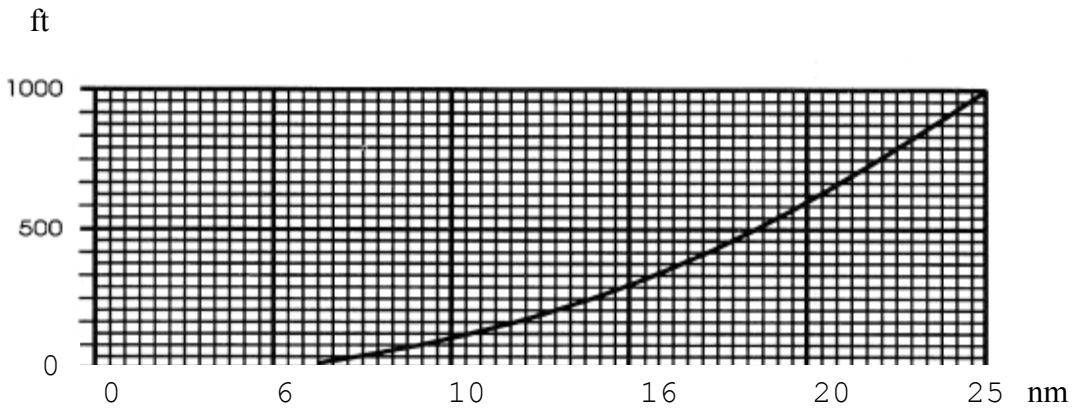


Figure J.8.9

- For beacons with **L class** (low altitude beacons) the beacons' coverage is given on Fig. J.8.10, J.8.11.

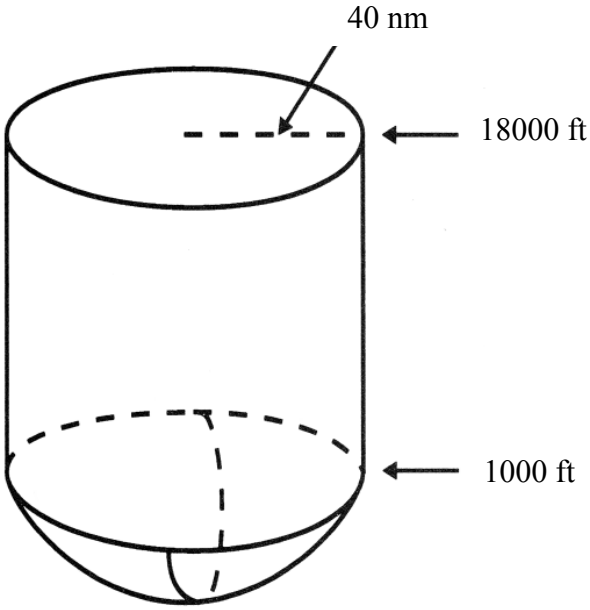


Figure J.8.10

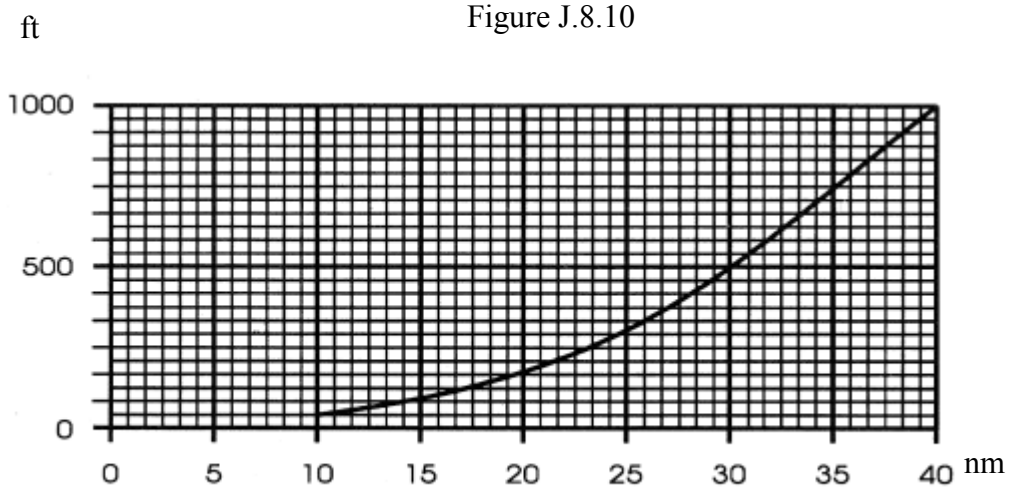


Figure J.8.11

- for beacons with **H class** (high altitude beacons), the beacons' coverage **U** is given on Fig. J.8.11, J.8.12.

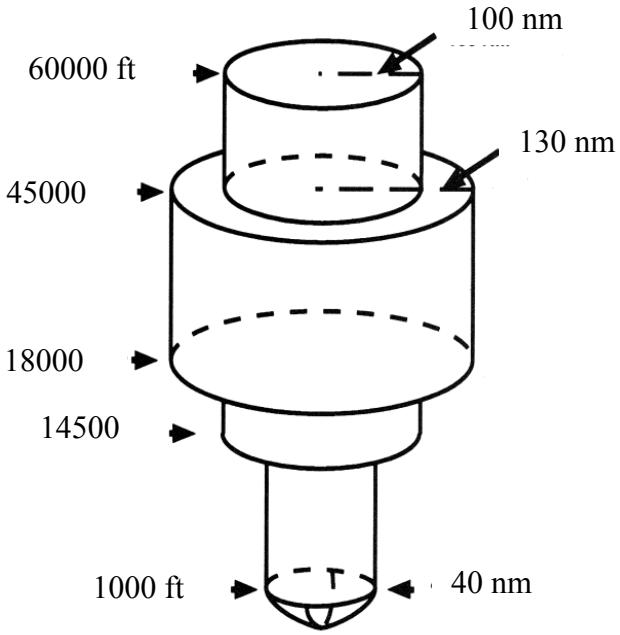


Figure J.8.12

MANUAL mode is purposed for the manual selection of one or two beacons, meeting the requirements, given at **AUTO** mode description.

Note – *for navigation solution two beacons are required at least, selected in auto or manual mode*.

TEST (**CTRL**) mode is purposed to tune VOR, DME airborne devices on the frequency, set by operator. At DME tuning it is permissible to tune DME on 1, 2 or 3 beacons. At one beacon tuning DME device shall be activated for one frequency mode. At 2 or 3 beacons tuning DME device shall be activated in directional scanning mode. In **CTRL** mode the beacon with the frequency indicated in the top line shall be selected for tuning. At VOR tuning the VOR device shall be always tuned on one beacon.

Beacons selection in AUTO mode

For the task of the beacons selection in AUTO mode:

a) set highlight to the beacons selection mode field;

b) turn internal knob of shaft encoder one position further; **MODE** popup window shall be indicated in **Tune VOR/DME** (Figure J.8.13);

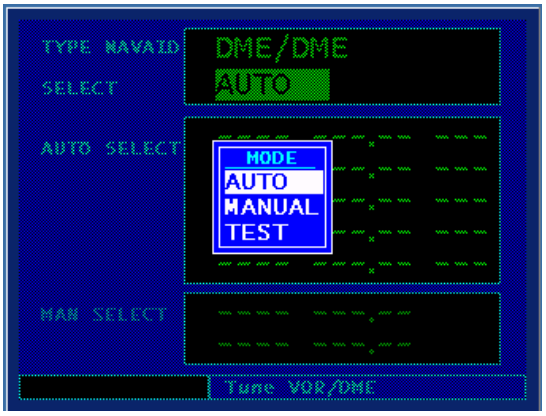


Figure J.8.13

c) set highlight on **AUTO** field. Press **ENT** button, the selected mode shall be indicated in **SELECT** field**,** RICU display; and five permitted to use nearest beacons, corresponded to the listed requirements, shall be indicated in **AUTO SELECT** field.

Beacons manual selection

To select beacons in manual mode:

a) set highlight on the beacons selection mode field;

b) turn the inner handle of shaft encoder for one position, **Tune VOR/DME** window shall indicate **MODE** popup window (Figure J.8.13);

c) set highlight on **MANUAL** field**.** Press **ENT** button;

d) set highlight on the field of beacons, selected in **MAN SELECT** manual mode, list;

e) press **MENU** button, **Tune VOR/DME** window shall indicate **PAGE MENU** popup window (Figure J.8.14);

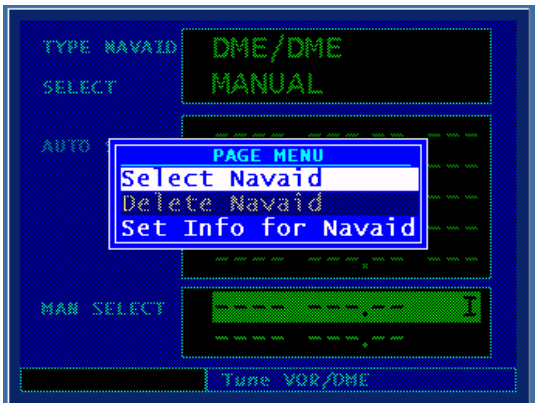


Figure.8.14

f) set highlight on **Select Navaid** field. Press **ENT** button; RICU display shall indicate **NRST4** page (Figure J.8.15).

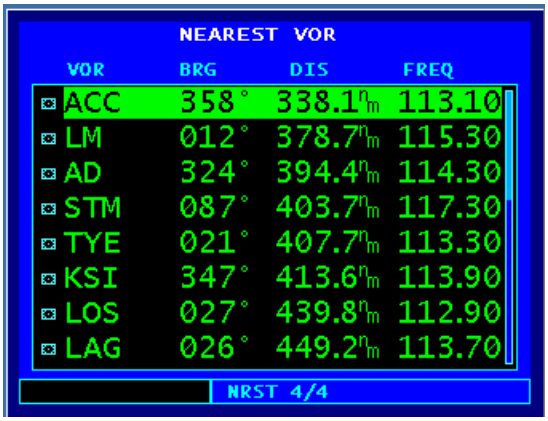


Figure J.8.15

Note – *Prohibited for use beacons are shaded. If no permitted for use beacons of selected type are available, then there will be no highlighted line in* ***NRST4*** *page. Press* ***CLR*** *button to return into* ***Tune VOR/DME*** *window.*

g) set highlight on the required beacon field Press **ENT**, RICU display shall indicate **Tune VOR/DME** window. The information of the selected beacon shall be indicated in the list of selected in manual mode beacons (Fig.J.8.16). In manual mode one or two beacons, involved into NT solution may be set.

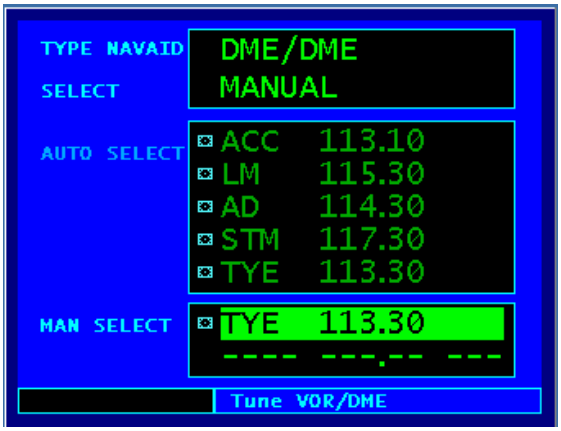


Figure J.8.16

Deletion of beacons from the manually selected beacons list

To delete the beacons from the manually selected beacons list:

a) set highlight on the beacons selection mode field;

b) turn internal knob of shaft encoder one position further, **Tune VOR/DME** window shall indicate **MODE** popup window (Fig. J.8.13);

c) set highlight to **MANUAL** window**.** Press **ENT**;

d) set highlight to the manually selected beacons list on identifier of the beacon subject to deletion from the list;

e) press **MENU** button, **Tune VOR/DME** window shall indicate **PAGE MENU** popup window (Fig. J.8.14);

f) set highlight to **Delete Navaid** field. Press **ENT**, and the selected beacon shall be deleted from the manually selected beacons list.

Selection of the beacon, the distance to which shall be indicated on DME device indicator

a) set highlight to the beacons selection mode field;

b) turn internal knob of shaft encoder one position further, **Tune VOR/DME** window shall indicate **MODE** popup window (Figure J.8.13);

c) set highlight to the required mode field (**AUTO** or **MANUAL**). Press **ENT**;

d) set highlight to the beacons list (**AUTO SELECT** or **MAN SELECT**) on identifier of the beacon, the distance to which shall be indicated on DME device indicator;

e) press **MENU**; **Tune VOR/DME** shall indicate **PAGE MENU** popup window (Fig. J.8.14);

d) set highlight to **Set Info for Navaid** field. Press **ENT**; DME device indicator shall indicate the distance to the selected beacon. **I** sign shall be indicated in the selected beacon line on RICU display.

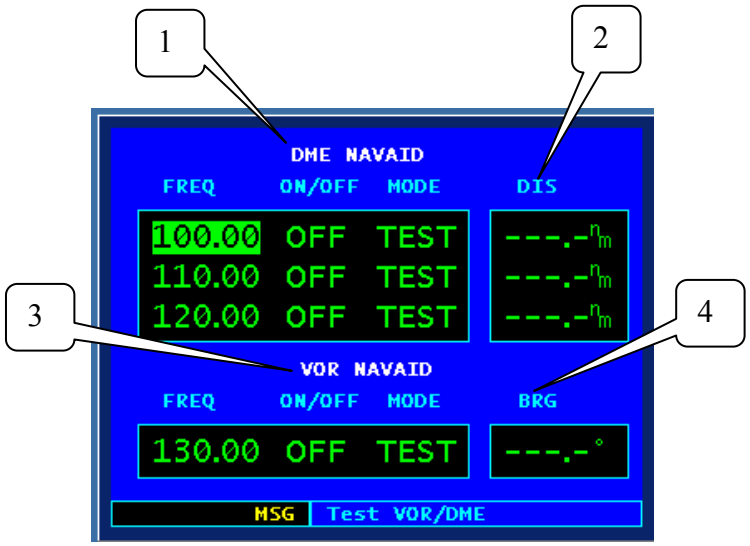
DME, VOR devices tuning in TEST (CTRL) mode

For DME, VOR devices tuning in **TEST** (**CTRL**) mode:

a) set highlight to the beacons selection mode field;

b) turn internal knob of shaft encoder one position further, **Tune VOR/DME** window shall indicate **MODE** popup window (Figure J.8.13);

c) set highlight to **TEST** field. Press **ENT**, RICU display shall indicate **Test VOR/DME** window (Fig. J.8.17).



1 Table for **DME** devices tuning frequency:
- **DME** device tuning frequency;
- switching on/off **DME** device tuning frequency delivery;
- tuning mode selection:
  - **TEST** mode – command word delivery for the airborne distance meter; "normal operation" command word status matrix;
  - **CTRL** mode- command word delivery for the airborne distance meter, "function test" command word status matrix;

2 Distance to beacon

3 Table for **VOR** device tuning (the information is analogous to that for **DME** device tuning**)**

4 Azimuth to beacon

Figure J.8.17

d) set highlight to **FREQ** field. Enter **DME** (**VOR**) device tuning frequency;

e) set highlight to **ON/OFF** field. Turn the inner handle of shaft encoder for one position;

Test VOR/DME window shall indicate **SELECT** popup window (Fig. J.8.18);

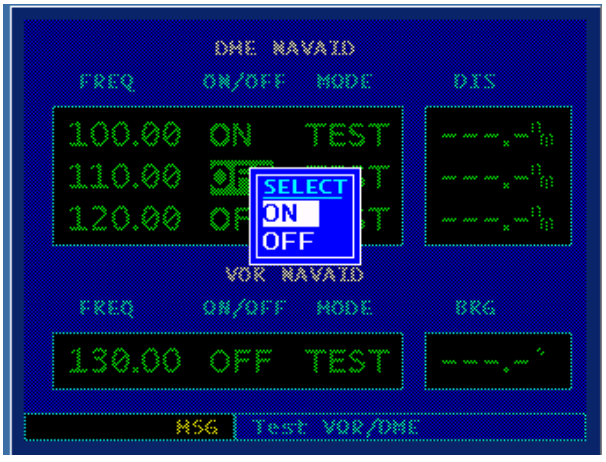


Figure J.8.18

f) set highlight to **ON/OFF** field to switch on/off the beacon form **DME** (**VOR**) device test.

g) set highlight to **MODE** field. turn the inner handle of shaft encoder for one position, **Test VOR/DME** window shall indicate **SELECT** popup window (Fig. J.8.19);

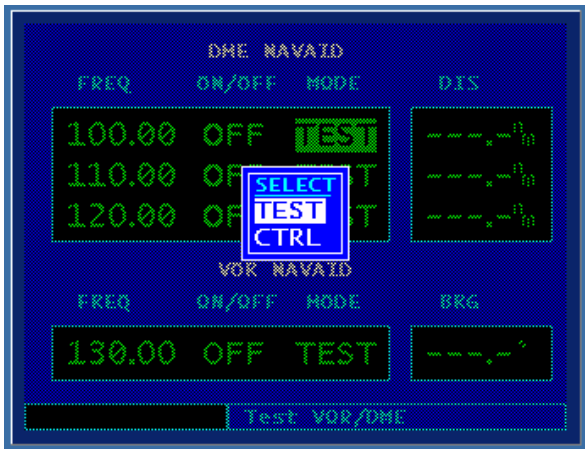


Figure J.8.19

h) select the tuning required mode. Press **ENT**.

Note - *at DME device tuning:*

*in **CTRL** control mode for tuning the beacon shall be selected, whose frequency is set in the top line;*

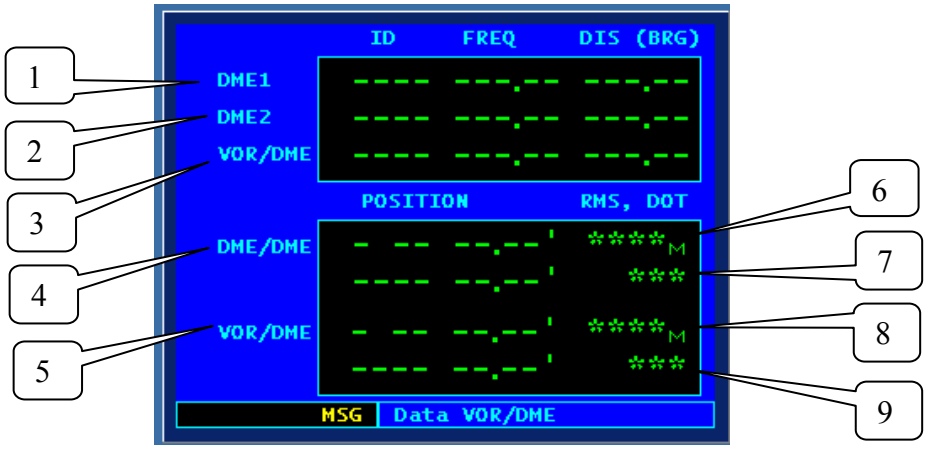
*- if in **MODE** field one beacon of **TEST (CTRL)** mode is set, for two other beacons the same mode shall be set.*

DATA VOR/DME field

DATA VOR/DME field is used to activate **Data VOR/DME** window, intended to display distance to beacon (for beacons DME) or bearing (for beacons VOR), received from airborne systems of distance and bearing determination.

To activate **Data VOR/DME** window set highlight to the field **DATA VOR/DME** (figure J.8.5) and press **ENT**. To return to **AUX2** page**,** press **CLR** button.

View of **Data VOR/DME** window is shown in figure J.8.20.



1 Information about the first beacon **DME** (line **DME 1**):
- reference designation;
- identifier;
- frequency, MHz;
- distance to the beacon **VOR**)

2 Information about the second beacon (**DME 2** line) (similar to pos. 1)

3 Information about the beacon **VOR** (**VOR/DME** line):
- reference designation;
- identifier;
- frequency, MHz;
- bearing to the beacon

4 Coordinates received using **DME** beacons (**DME/DME** line)

5 Coordinates received using **VOR** beacons (**VOR/DME** line)

6, 8 Positional accuracy

7, 9 Time after navigation decision receiving, seconds

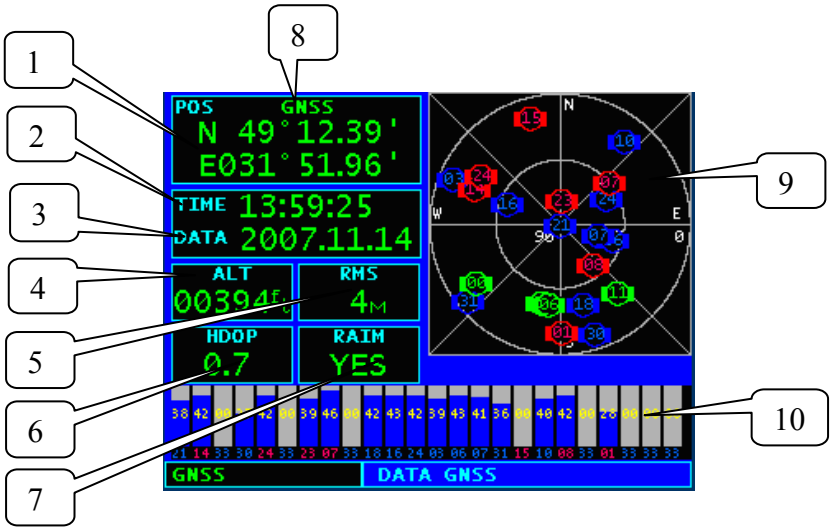
Figure J.8.20

DATA GNSS field

DATA GNSS field is used to activate **DATA GNSS** window, intended for display of main operation parameters of GNSS receiver.

To activate **DATA GNSS** window**,** set highlight to **DATA GNSS** field (figure J.8.5) and press **ENT**. To return to **AUX2** page**,** press **CLR** button.

View of **DATA GNSS** window is shown in figure J.8.21.



1 Current coordinates
2 Time
3 Date
4-7 Interchangeable fields
8 Sign of receipt of initial coordinates of NP:
- - coordinates, received from the receiver GNSS;
- **Restore** – restored coordinates, received before the last shutdown of RICU;
- **ID identifier of WP** - coordinates, selected from NDB;
- **Manual** - manual input of coordinates;
- **CROSS-BPIU** – coordinates received from other RICU;
- « » - coordinates are not defined

9 Graphic display of visible SV, situated above the horizon (almanac):
- red – SNS GLONASS;
- blue - SNS GPS;
- green – Satellite Based Augmentation System SBAS

10 Signal/noise ratio on each channel

Note - *24 column (pos.10) correspond to 24 channel of the receiver GNSS. Each column shows S/N ratio in graphic and digital view of SV, which number is stated under the column (figures of red colour - SNS GLONASS, blue - SNS GPS). Signal/noise correlation is shown only for those satellites, which are involved into NT solution.*

Figure J.8.21

The figure J.8.21 shows factory setting of parameters, displayed in interchangeable fields. List of parameters, which can be displayed in interchangeable fields pos. 4-7, is shown in table J.8.1.

Table J.8.1

Symbol in the form	Parameter name
ALT	Altitude
HIL	Horizontal integrity limit
VIL	Vertical integrity limit
HDOP	Horizontal geometric factor
VDOP	Vertical geometric factor
RMS	Root-mean-square deviation
RMSH	Root-mean-square deviation on altitude
RAIM	Off-line test of integrity of GNSS signals
VGNS	Number of visible GPS+ GLONASS satellites
WGNS	Number of operating GPS+ GLONASS satellites
VGPS	Number of visible GPS satellites
WGPS	Number of operating GPS satellites
VGLN	Number of visible GLONASS satellites
WGLN	Number of operating GLONASS satellites

Input of initial coordinates

Input of initial coordinates can be accomplished only if data from GNSS sensor are not available.

For initial coordinates manual input:

a) set highlight to the field of coordinates;

b) input initial coordinates;

c) press ENT to confirm input of set coordinates. RICU display shall indicate **DATA GNSS** window with input coordinates and the sign of the coordinates manual input, **Manual.**

Input of initial coordinates can be performed from NDB (after pressing **MENU** button).

Input of time and date

Input of time and date can be accomplished only if data from GNSS sensor are not available.

To input time and date:

a) set highlight to the field of time (date);

b) enter current time (date);

c) press ENT to confirm input of set time (date).

Operations being accomplished in DATA GNSS window by pressing MENU button

PAGE MENU pop-up menu is displayed in **DATA GNSS** window by pressing **MENU** button (figure J.8.22), its fields are used to perform the following operations:

- setup of interchangeable fields (**Change Fields** field);
- adjustment of interchangeable fields according to factory setting (**Restore Defaults** field);
- input of initial coordinates from NDB (**Reference WP** field);
- setup of text view of satellites position (**Text View SATs** field);
- setup of graphic view of satellites position (**Graphics View SATs** field).

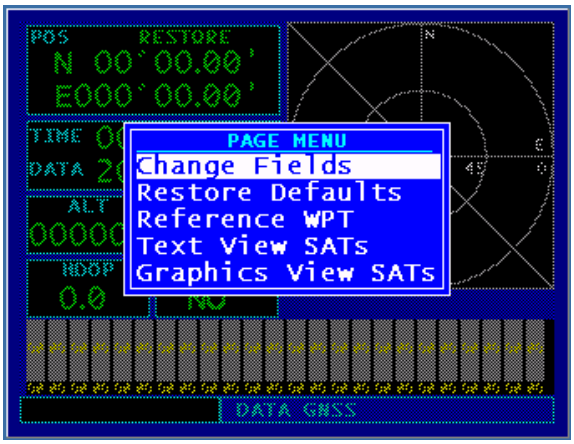


Figure J.8.22

Setup of interchangeable fields

To setup interchangeable fields, perform the following steps:

a) set highlight to **Change Fields** field in **PAGE MENU** pop-up window (figure J.8.22);

b) press **ENT**. **PAGE MENU** window will stop being displayed in **DATA GNSS** window. Mnemonic symbol of one of interchangeable fields is highlighted;

c) set highlight to the interchangeable field of the parameter, which must be changed;

d) turn internal knob one position further. **SELECT FIELD TYPE** window is displayed in **DATA GNSS** window (figure J.8.23);

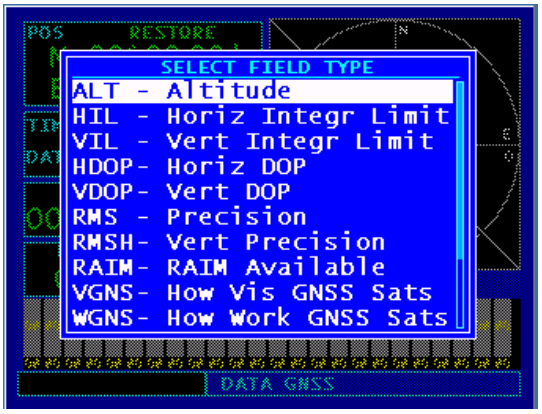


Figure J.8.23

e) set highlight in **SELECT FIELD TYPE** window to the parameter, which must be displayed in **DATA GNSS** window instead of parameter being changed;

f) press **ENT** to confirm change, **SELECT FIELD TYPE** window will stop being displayed. Selected parameter is displayed in **DATA GNSS** window in selected interchangeable field. Mnemonic symbol of one of interchangeable fields is highlighted;

g) perform similarly all required changes of interchangeable fields;

h) press **CLR** button to exit from the mode of change of interchangeable fields. Highlight of interchangeable filed will disappear.

Setup of interchangeable fields according to factory setting

To setup interchangeable fields according to factory setting:

a) set highlight to **Restore Defaults** field in **PAGE MENU** pop-up window (figure J.8.22);

b) press **ENT**;

c) **PAGE MENU** pop-up window will stop being displayed in **DATA GNSS** window. **DATA GNSS** window will display interchangeable fields according to factory setting.

Input of initial coordinates from NDB

Input of initial coordinates can be accomplished only if data from GNSS sensor are not available.

To input initial coordinates from NDB:

a) set highlight to **Reference WP** field in **PAGE MENU** pop-up window (figure J.8.22);

b) press **ENT**. **WPT1** window is displayed on RICU;

c) set the page of the form **WP**, which provides overview of WP, which coordinates must be used as initial;

d) input identifier of WP. Press **ENT**. Highlight will move to the **DONE?** field;

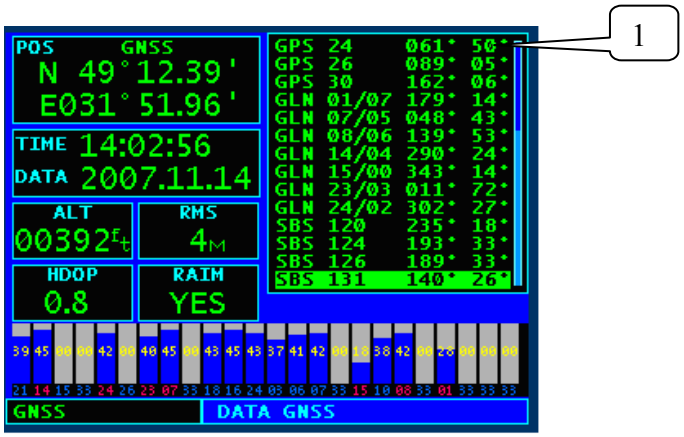
e) press **ENT**. RICU displays **DATA GNSS** window with input coordinates from NDB and the sign of receipt of coordinates from NDB.

Setup of text view of satellites position

To setup text view of satellites position:

a) set highlight to **Text View SATs** field in **PAGE MENU** pop-up window (figure J.8.22);

b) press **ENT**. **DATA GNSS** window is displayed on RICU according to figure J.8.24.



1 Line of parameters of visible SV:
- symbol of SNS or system of functional addition;
- number of satellite/number of character
- bearing of the place
- angle of elevation

Figure J.8.24

Setup of graphic view of satellites position

To setup graphic view of satellites position:

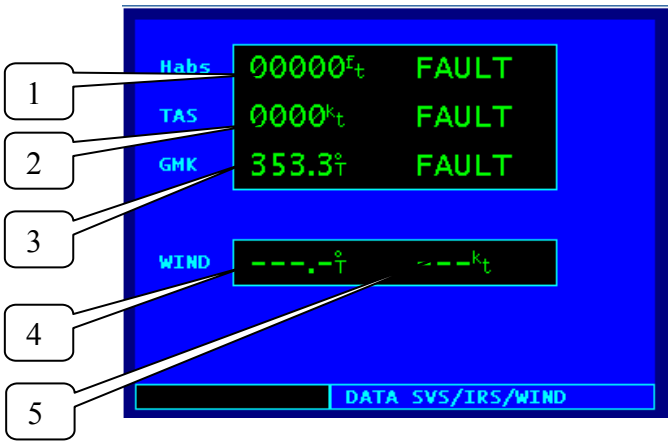
a) set highlight to **Graphics View SATs** field in **PAGE MENU** pop-up window (figure J.8.22);

b) press **ENT**. **DATA GNSS** window is displayed on RICU according to figure J.8.21.

DATA SVS/IRS/WIND field

DATA SVS/IRS/WIND field is used to activate **DATA SVS/IRS/WIND** window, intended to display information from sensors of air parameters (SVS), course system (IRS) and also to indicate and input wind parameters.

To activate **DATA SVS/IRS/WIND** window**,** set highlight on **DATA SVS/IRS/WIND** field (figure J.8.5) and press **ENT**. To return to **AUX2** page**,** press **CLR** button.
View of **DATA SVS/IRS/WIND** window is shown in figure J.8.25.



1 Altitude of AC and sign of value accuracy (**FAULT** – not reliable, **OK** - reliable)
2 Speed of AC and sign of value accuracy
3 Gyromagnetic course of and sign of value accuracy
4 Wind direction (metro wind)
5 Wind speed

Figure J.8.25

Input of wind parameters

Automatic calculation of wind parameters occurs:

- failing «**Strut compression**» one-time command or if aircraft speed is no less than 70 m/s;
- in the presence of navigation solving using GNSS sensor, VOR/DME or DME /DME devices

If input of wind parameters is required:

a) press **CRSR** button. Wind direction field will be highlighted. Insert the required value of wind direction. Press **ENT** button for inserted value confirmation;

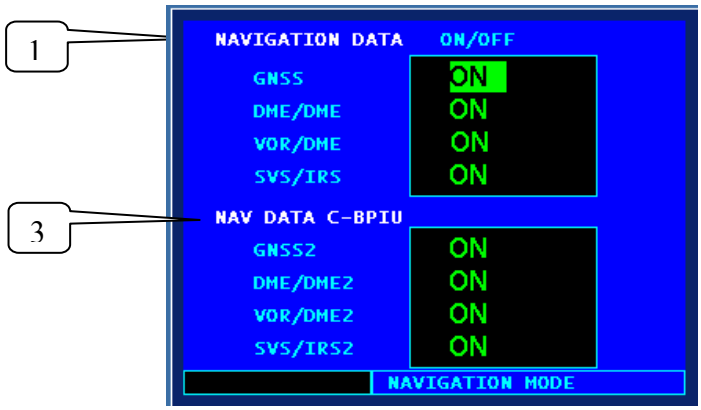
b) Wind speed field will be highlighted. Insert the required value of wind speed. Press **ENT** button for inserted value confirmation.

NAVIGATION MODE field

NAVIGATION MODE field is designed for **NAVIGATION MODE** call, necessary for the navigation data source selection, used for the complex NT solution.

For **NAVIGATION MODE** window call install highlight in **NAVIGATION MODE** field (Fig. J.8.5) and press **ENT**. To return on **AUX2** page press **CLR**.

View of **NAVIGATION MODE** window is shown in fig. J.8.26.



1 Use control of navigation data source in the complex NT solution:
- GNSS sensor;
- DME/DME device;
- VOR/DME device;
- SVS/IRS sensor

2 Use control of navigation data source in the complex NT solution from other RICU

Note - *Removal of SVS/ IRS and SVS/ IRS2 sensors from the list of navigation data sources used in the complex NT solution is impossible.*

Figure J.8.26

Navigation data source selection, used for the complex NT solution

For navigation data source selection, used for the complex NT solution:

a) set highlight on "switching on/off navigation database source solution" field opposite the required source;

b) turn internal knob of shaft encoder one position further. RICU display shall indicate **SELECT** pop-up window (Fig. J.8.27);

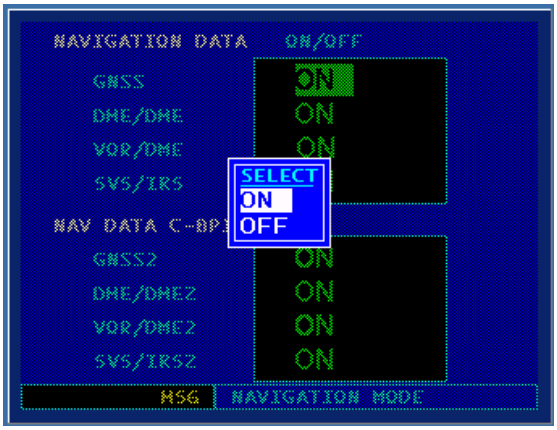


Figure J.8.27

c) set highlight on **ON** field to switch on, and in **OFF** to switch off the selected navigation data source use for complex NT solution;

d) press **ENT**.

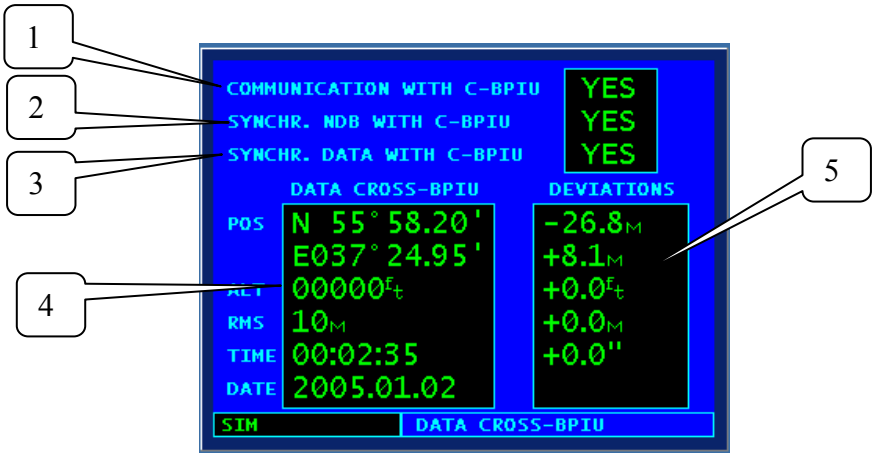
Note – *Switching off all sources shall disable the complex NT solution*.

DATA CROSS - RICU field

The **DATA CROSS - RICU** field is used to activate the **DATA CROSS - RICU** window, intended to display data from other RICU and to input coordinates received by other RICU as reference coordinates.

To activate **DATA CROSS - RICU** window set highlight to **DATA CROSS - RICU** field (figure J.8.5) and press **ENT**. To return to **AUX2** page**,** press **CLR** button.

View of **DATA CROSS - RICU** window, if there is connection with other RICU, is shown in figure J.8.28.



1 Connection with the other RICU available (**YES**) or not available (**NO**)
2 Synchronization with NDB of the other RICU available (**YES**) or not available (**NO**)
3 Synchronization with user DB of the other RICU available (**YES**) or not available (**NO**)
4 Field of display of navigation data, received by RICU2:
- coordinates;
- altitude;
- accuracy of coordinates determination;
- time required to receive coordinates;
- date

5 Navigation data discrepancy, received by two RICUs, indication field:
- as to latitude;
- as to longitude;
- as to altitude;
- as to accuracy of coordinates determination;
- as to time required to receive coordinates

Figure J.8.28

The input of coordinates received by other RICU as reference ones.

To input of coordinates received by other RICU as reference ones:

a) Press **MENU** button. **PAGE MENU** pop-up window is indicated in **DATA CROSS - RICU** window (figure J.8.29)**.** When there are navigation data from other RICU and navigation data from GNSS sensor are not available **Set Nav Data from C-RICU** field is highlighted;

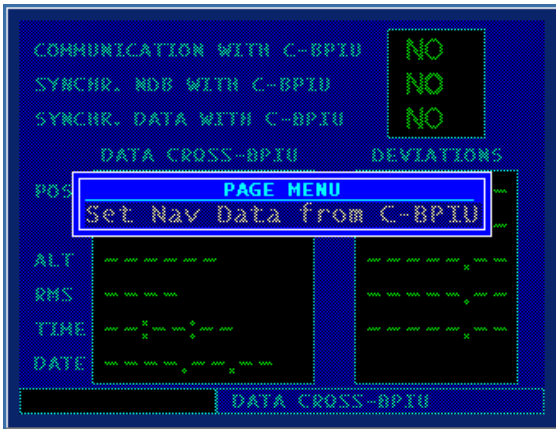


Figure J.8.29

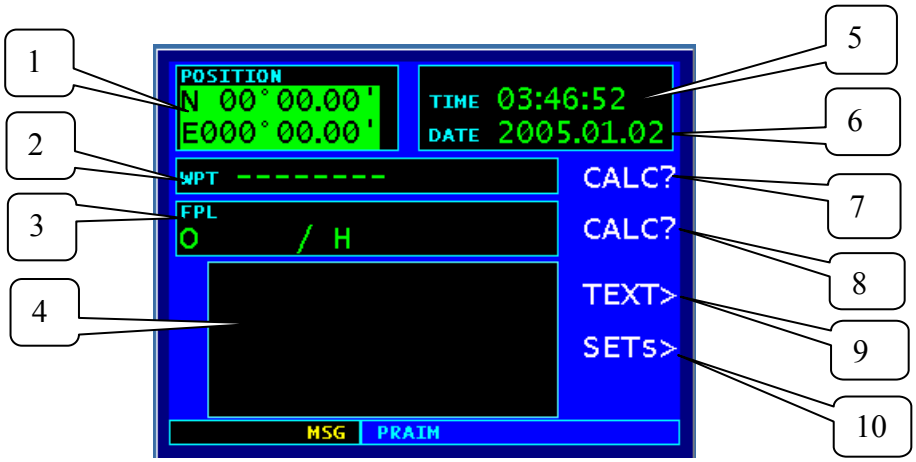
b) Press **ENT** button. **PAGE MENU** pop-up window ends to be displayed in **DATA CROSS – RICU** box. The flag of reference coordinate receiving from other RICU (**CROSS-BPIU**) is displayed in **DATA GNSS** window.

PREDICTIVE RAIM field

PREDICTIVE RAIM field is used to activate **PRAIM** window, intended for calculation of forecast **RAIM** in planned WP or for active flight plan and display of forecast results of function **RAIM** accessibility in graphic and text view.

To activate **PRAIM** window set highlight to the field **PREDICTIVE RAIM** and press **ENT**. To return to **AUX2** page**,** press the **CLR** button.

View of the window **PRAIM** is shown in figure J.8.30.



1 Coordinates of NP, for which forecast of function **RAIM** accessibility is being accomplished
2 Identifier of NP, for which forecast of function **RAIM** accessibility is being accomplished
3 Name of an active flight plan
4 Field for display of forecast results of function **RAIM** accessibility in graphic view
5 Start time of function **RAIM** accessibility forecast calculation accomplishment
6 Data of function **RAIM** accessibility forecast calculation accomplishment
7 Command of function **RAIM** accessibility forecast calculation accomplishment for a selected NP
8 Command of function **RAIM** accessibility forecast calculation accomplishment for active flight plan
9 Output of function **RAIM** accessibility forecast results in text view
10 Setting of parameters for function **RAIM** accessibility forecast calculation

Figure J.8.30

Function RAIM accessibility forecast calculation for NP

Function **RAIM** accessibility forecast determination for NP is provided within 12 hours from specified calculation start time.

To accomplish function **RAIM** accessibility forecast calculation:

a) select NP, for which forecast must be accomplished;

b) set start time and date of function **RAIM** accessibility forecast calculation;

c) if it is necessary to change factory setting, accomplish parameters setting for function **RAIM** accessibility forecast calculation;

d) set command of function **RAIM** accessibility forecast calculation accomplishment for a selected NP.

Selection of NP for function RAIM accessibility forecast calculation

Selection of NP for function **RAIM** accessibility forecast calculation is accomplished by input of:

- NP coordinates in **POSITION** field**;**
- NP identifier in **WP** field.

To input NP coordinates in POSITION field:

a) set highlight to **POSITION** field;

b) set NP coordinates, for which function **RAIM** accessibility forecast calculation must be accomplished;

c) press **ENT** to confirm input of set coordinates.

To input identifier of NP in the field WP:

a) set highlight to **WP** field (figure J.8.31);

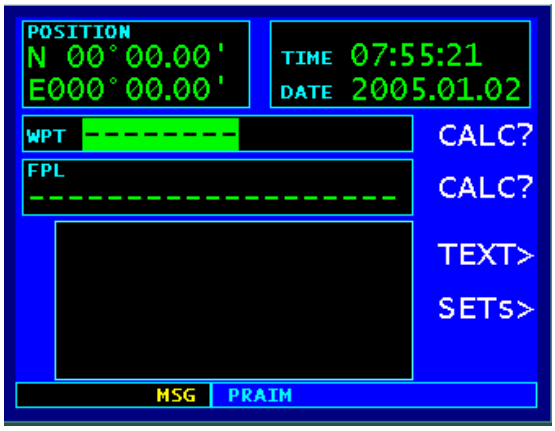


Figure J.8.31

b) turn internal knob of shaft encoder one position further. RICU display shows **WPT1** page;

c) set page of **WP** form of required category and input identifier of NP;

d) set highlight to **Done?** field and press **ENT**. RICU display shows window of RAIM forecast calculation. Identifier of a selected NP is displayed in **WP** field, and coordinates of a selected NP in **POSITION** field.

Setup of start time and date of function RAIM accessibility forecast calculation

To set start time and date of function **RAIM** accessibility forecast calculation:

a) set highlight to **TIME** (**DATE**) field;

b) set required time (date) of forecast start;

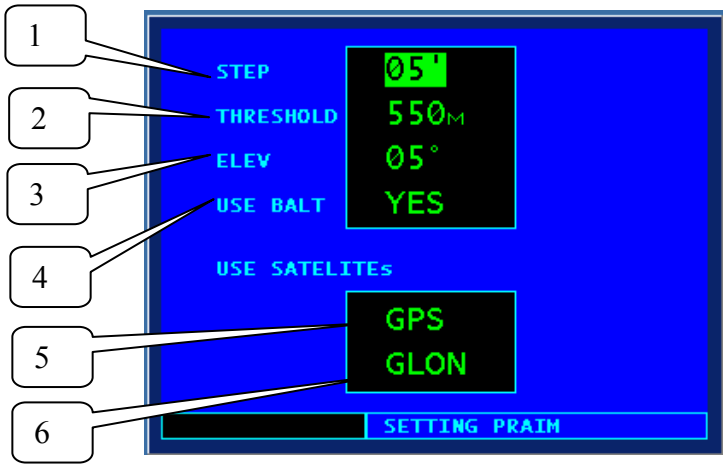
c) press **ENT** to confirm input of set time (date).

Setup of parameters for function RAIM accessibility forecast calculation – the window SETTING PRAIM

Setup of parameters for function **RAIM** accessibility forecast calculation is accomplished in **SETTING PRAIM** window.

To activate **SETTING PRAIM** window**,** set highlight to **SETs** field (figure J.8.30) and press **ENT** button. To return to **PRAIM** window**,** press **CLR** button.

View of **SETTING PRAIM** window is shown in figure J.8.32.



1 Step of function **RAIM** accessibility forecast calculation
2 Limit of integrity signalling
3 Angle of elevation of satellites over the horizon
4 Inclusion /exclusion of barometric altitude into/from calculation
5 Field of activation of the list NSV GPS
6 Field of activation of the list NSV GLONASS

Figure J.8.32

Setup of values of step of RAIM forecast calculation, limit of integrity signalling, angle of elevation

To set values of step of **RAIM** forecast calculation, limit of integrity signalling, angle of elevation:

a) set highlight to the parameter, which value it is necessary to set;

b) set required value of the parameter;

c) press **ENT** to confirm input of set value of the parameter.

Note – *When calculating **RAIM** accessibility forecast for approaching stage, set step of **RAIM** forecast calculation for 5 minutes.*

Inclusion /exclusion of barometric altitude into/from calculation

To include/exclude barometric altitude into/from calculation:

a) set highlight on **USE BALT** field (Fig. J.8.32);

b) turn internal knob of shaft encoder one position further. **SETTINGS PRAIM** window shall indicate the popup window for barometric altitude inclusion/exclusion into/from calculation (Fig. J.8.33)

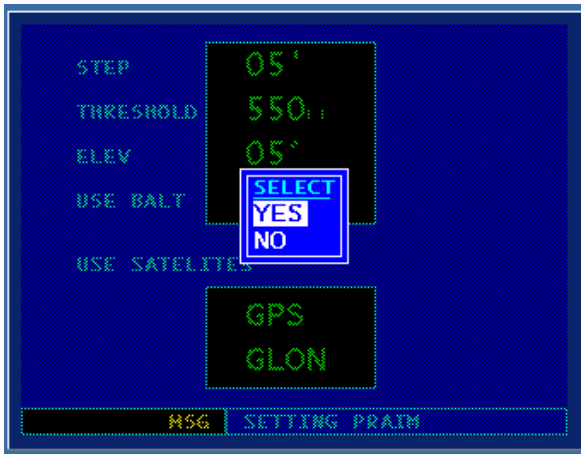


Figure J.8.33

c) set highlight on **YES** field to include the barometric altitude into calculation, **NO** – to exclude;

d) press **ENT** to confirm inclusion/exclusion into/from calculation.

Inclusion or exclusion of NSV from RAIM forecast calculation

To include (exclude) NSV in (from) **RAIM** forecast calculation:

a) set highlight to the field of activation of the list NSV **GPS** (**GLON**) (figure J.8.32);

b) turn internal knob one position further. The window **SETTINGS PRAIM** shows pop-up window of inclusion/exclusion of satellites **GPS** (**GLON**) from **RAIM** forecast calculation (figure J.8.34);

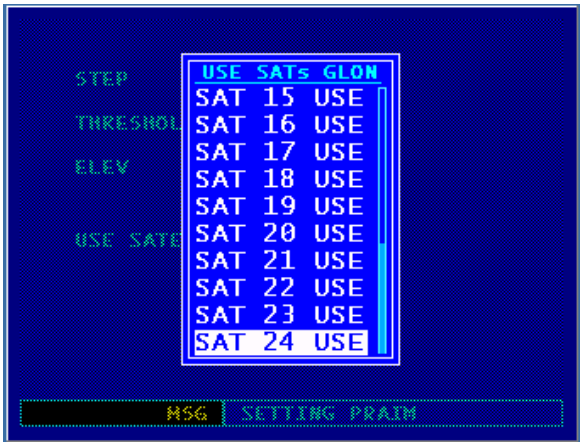


Figure J.8.34

c) set highlight to the field with number of satellite, which must be included (excluded) from calculation. By rotating internal knob, set **USE** – to include, **OFF** – to exclude satellite from calculation;

d) press **ENT** to confirm inclusion/exclusion of satellites from calculation.

Setup of command of function RAIM accessibility forecast calculation accomplishment for a selected NP HT

To setup a command of function **RAIM** accessibility forecast calculation accomplishment for a selected NP:

a) set highlight to the field **CALC** opposite the field **WP**;

b) press **ENT**, display will show results of function **RAIM** accessibility forecast calculation in graphic view (figure J.8.35).

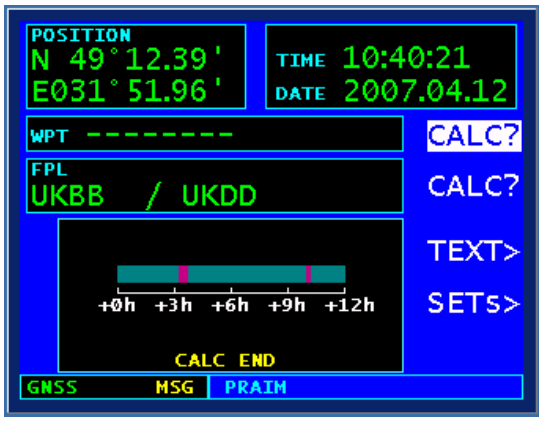


Figure J.8.35

Forecast results

Red colour on diagram means that RAIM forecast is not available, blue colour - RAIM forecast is available.

Appearance of the message about error **CALC ERROR 2** on RICU display means, that GNSS sensor doesn't respond to requests, repeat the forecast calculation of RAIM function availability.

Function RAIM accessibility forecast calculation for active flight plan

Function **RAIM** accessibility determination for active flight plan is provided within length of the flight plan from specified start time of movement according to a flight plan.

By using set averaged speeds of AC in **LIMIT DATA** window of **AUX3** page (description of this window and setup of parameters in it are given in description of **AUX3** page) and period of time, in which forecast calculation is accomplished (see description of **SETTING PRAIM** window), coordinates of calculating points and time of flying over them are calculated. RAIM forecast is calculated for each calculating point and is compared with factory setting of limits. Value of limit for terminal areas is set to 550 m (0,3 NM.). Value of limit for a flight plan is set to 1,8 km(1 mile). Change of these limits is not accessible for user.

To accomplish function **RAIM** accessibility forecast calculation for active flight plan:

a) set start time and date of forecast calculation accomplishment (start of flight according to a flight plan).

Setup of time and date is shown in description of function **RAIM** accessibility forecast calculation for NP;

b) if it is necessary to change factory settings, set parameters (except limit of integrity signalling) for function **RAIM** accessibility forecast calculation (see description of **SETTING PRAIM** window **-** figure J.8.32);

c) set averaged value of AC speed on the page **AUX3** window **LIMIT DATA** in the field:

- **AVERAGE SPEED**:
  - **DEPARTURE** **-** for terminal area of departure;
  - **ENROUTE** **-** for averaged flight part;
  - **ARRIVAL** **-** for terminal area of arrival;

d) set command of function **RAIM** accessibility forecast calculation accomplishment for active flight plan:

- set highlight to the **CALC** field opposite the field **FPL**;
- press **ENT**, display will show results of function **RAIM** accessibility forecast calculation in graphic view (figure J.8.36).

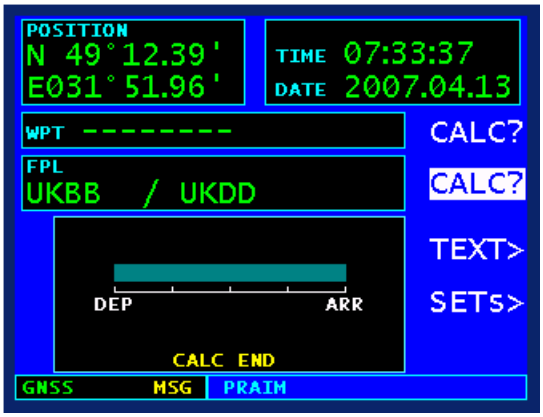


Figure J.8.36

Forecast results

Red colour on diagram means that RAIM forecast is not available, blue colour - RAIM forecast is available. Appearance of the message about error **CALC ERROR n** (figure J.8.37), where **n,** number of error means:

- **n=2** – sensor GNSS doesn't respond to requests;
- **n=3** – speed parameters for calculation are set incorrect;
- **n=4** – error of flight plan length part calculation;
- **n=5** – number of calculation points equals zero.

In the case if message of error **CALC ERROR n** appears on RICU display, repeat the forecast calculation of RAIM function availability.

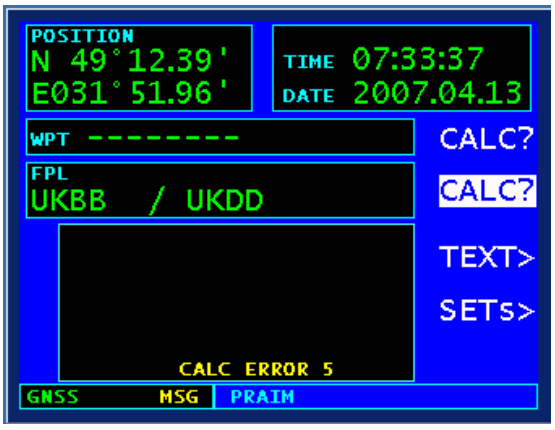


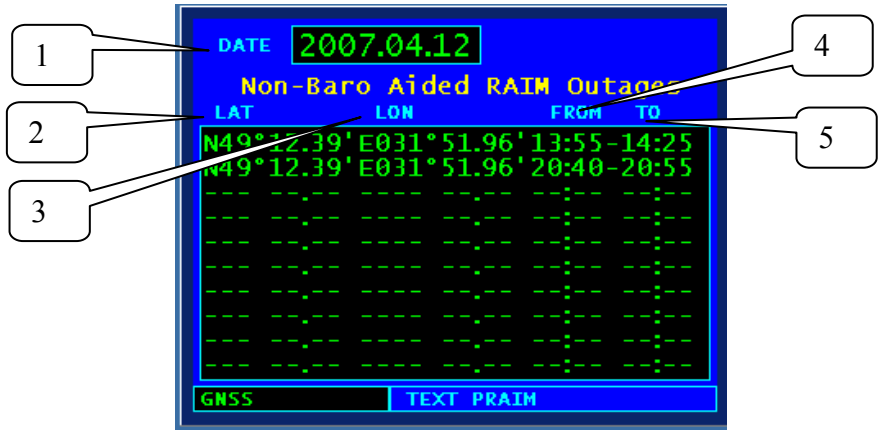
Figure J.8.37

Output of results of function RAIM accessibility forecast (for NP and for active flight plan) in text view

To output results of function **RAIM** accessibility forecast in text form:

a) set highlight to **TEXT** field in **PRAIM** window;

b) press **ENT** button, RICU display shows the window of function **RAIM** accessibility forecast results in the form of a table (figure J.8.38).



1 Date of determination of function **RAIM** accessibility forecast
2 Latitude of WP, for which function **RAIM** accessibility forecast was calculated
3 Longitude of WP, for which function **RAIM** accessibility forecast was calculated
4, 5 Period of time (range «from-to»), in which RAIM forecast is not available

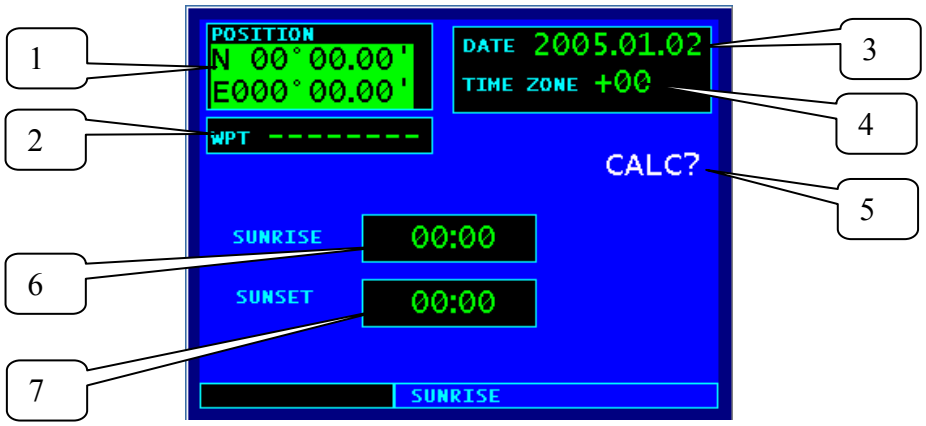
Figure J.8.38

SUNRISE field

SUNRISE field is used to activate **SUNRISE** window, intended for sunrise and sunset time calculation.

To activate **SUNRISE** window set highlight to the **SUNRISE** field and press **ENT**. To return to **AUX2** page**,** press **CLR** button.

View of **SUNRISE** window is shown in figure J.8.39.



1 Coordinates of NP
2 Identifier of NP
3 Date
4 Adjustment of zone time (in case of zero correction – time according to Greenwich)
5 Command of sunrise and sunset time calculation execution
6 Sunrise time (taking into account input adjustment of zone time)
7 Sunset time (taking into account input adjustment of zone time)

Figure J.8.39

Sunrise and sunset time calculation

Coordinates of current NP are displayed in opened window **SUNRISE** in **POSITION** field, and current data in the field **DATE**.

To accomplish sunrise and sunset time calculation for given NP:

a) select NP, for which calculation must be accomplished;

b) set required calculation date;

c) set zone time adjustment;

d) set command of sunrise and sunset time calculation execution.

Selection of NP for sunrise and sunset time calculation

Selection of NP for sunrise and sunset time calculation is accomplished by analogy with selection of NP for function **RAIM** accessibility forecast calculation, given in description of function **RAIM** accessibility forecast calculation for NP.

Setting of date of sunrise and sunset time calculation

To set date of sunrise and sunset time calculation:

a) set highlight to **DATE** field (figure J.8.39);

b) set required calculation date;

c) press **ENT** to confirm input of set date.

Setting of zone time adjustment

To set zone time adjustment:

a) set highlight to **TIME ZONE** field (figure J.8.39);

b) set zone time adjustment;

c) press **ENT** to confirm input of set adjustment.

Setting of command of sunrise and sunset time calculation accomplishment

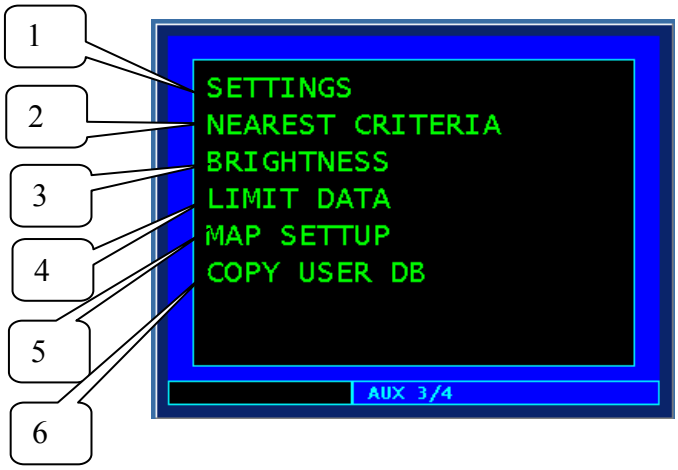
To set command of sunrise and sunset time calculation execution:

a) set highlight to the field **CALC** (figure J.8.39);

b) press **ENT**, results of sunrise (filed **SUNRISE)** and sunset (field **SUNISET**) time calculation will be displayed in the window **SUNRISE**.

AUX3 page

View of **AUX3** page is shown in figure J.8.40.



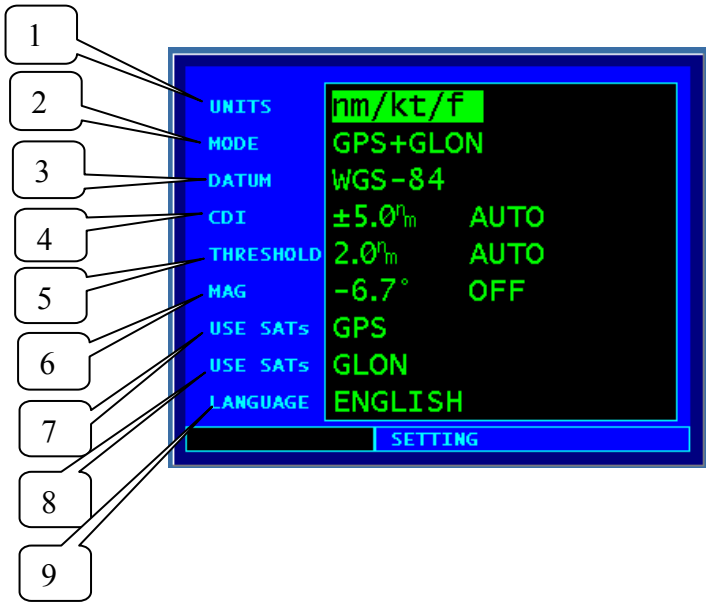
1 Setting of system parameters
2 Setting of criteria of nearest airports selection
3 Setting of brightness
4 Setting of parameters for calculation of standard procedures and RAIM calculation
5 Setting of map parameters
6 Transfer of user database (user NP, routes) to other RICU (field is accessible for work only if there is connection with other RICU)

Figure J.8.40

SETTINGS field

SETTINGS field is used to activate **SETTING** window, intended to set system parameters. To activate **SETTING** window**,** set highlight to **SETTINGS** field and press **ENT**. To return to **AUX3** page**,** press **CLR** button.

View of **SETTING** page is shown in figure J.8.41.



1 System of units
2 Operation mode of equipment
3 System of coordinates
4 Scale of deviation from DT (CDI), sign of automatic or manual setting of scale
5 Threshold of integrity signalling, sign of automatic or manual setting of limit of integrity signalling
6 Activation/deactivation of magnetic declination registration
7 Activation/deactivation of satellites GPS from navigation parameters calculation
8 Activation/deactivation of satellites GLON from navigation parameters calculation
9 Language of messages

Figure J.8.41

Setting of system of units

To set system of units:

a) set highlight to the field of display of units (field **UNITS** figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays pop-up window of selection of system of units **SETTING UNIT** (figure J.8.42);

Figure J.8.42

c) set highlight to the field of display of required system of units;

d) press **ENT** to confirm setting of selected system of units.

Selection of operation mode of equipment

To select operation mode of equipment:

a) set highlight to the field of display of operation mode of equipment (**MODE** field, figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays pop-up window of selection of operation modes of equipment **SETTING MODE** (figure J.8.43);

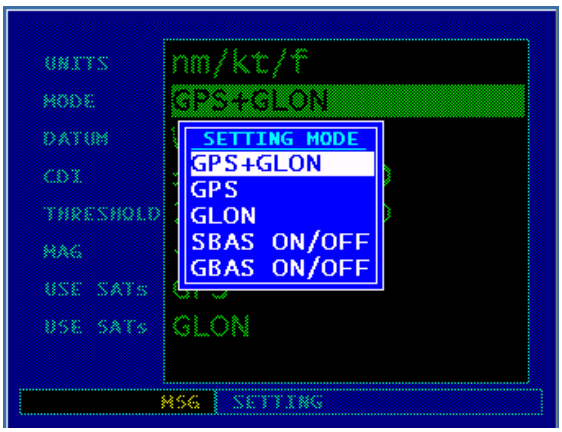


Figure J.8.43

c) set highlight to the field of display of required operation mode of equipment (**GPS**, **GPS+GLON** or **GLON**);

d) press **ENT** to confirm input of required operation mode of equipment;

e) if it is necessary to activate/deactivate the use of Satellite Based Augmentation System **SBAS** (**GBAS**), set highlight in **SETTING MODE** pop-up window to **SBAS ON/OFF** (**GBAS ON/OFF**) field and press **ENT** (figure J.8.44).

Note – S*ystem of functional addition SBAS, GBAS must not be used. Instruction about possibility of the use of this system will be input to UM by notice.*

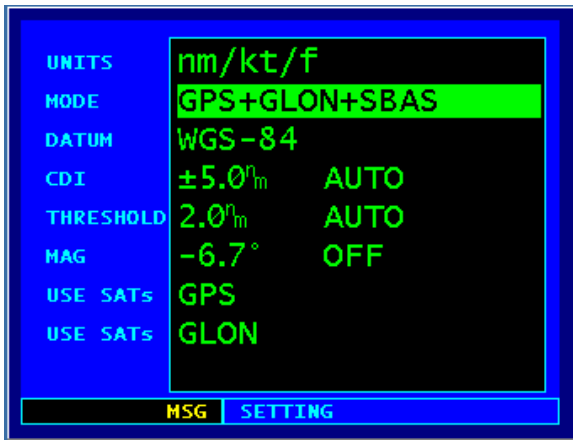


Figure J.8.44

Selection of system of coordinates

To select system of coordinates:

a) set highlight to the field of display of system of coordinates (**DATUM** field, figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays pop-up window of selection of **SETTING DATUM** system of coordinates (figure J.8.45);

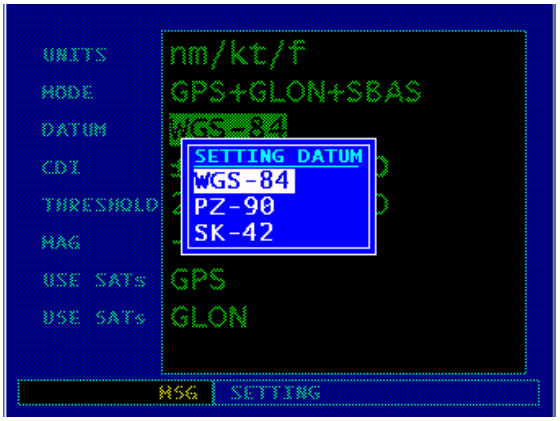


Figure J.8.45

c) set highlight to the field of display of required system of coordinates;

d) press **ENT** to confirm setting of required system of coordinates.

Setting of CDI scale factor

To set CDI scale factor:

a) set highlight to numerical value of CDI scale factor (**CDI** field, figure J.8.41);

b) turn internal knob one position further. **SETTINGS** window displays pop-up window of selection of scale CDI factor value **SELECT CDI** (figure J.8.46);

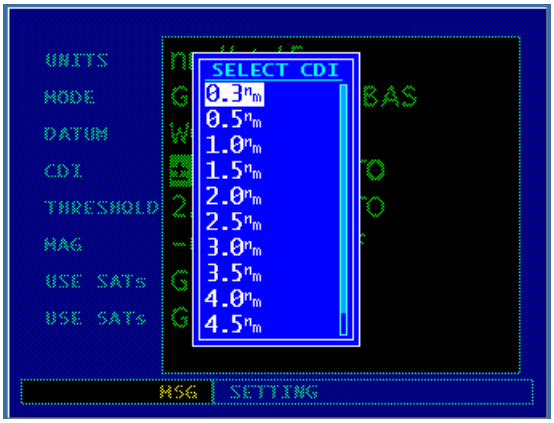


Figure J.8.46

c) set highlight to the field of display of required CDI scale factor;

d) press **ENT** to confirm input of selected CDI scale factor. The **CDI** field displays sign of manual input of CDI scale factor **MANUAL** (figure J.8.47).

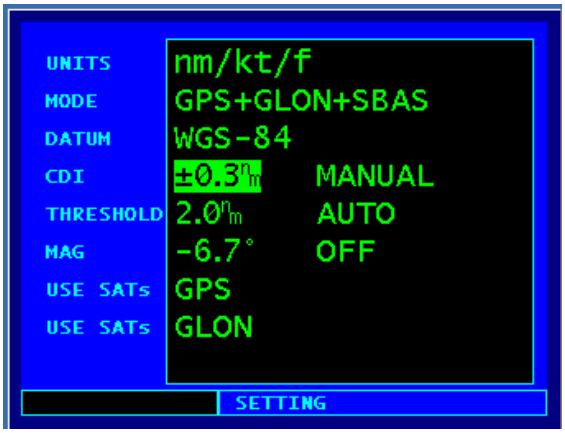


Figure J.8.47

Activation of automatic setting of CDI scale factor

To activate automatic setting of CDI scale factor:

a) set highlight to the sign of automatic or manual setting of CDI scale factor (**CDI** field, figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays the pop-up window of selection of automatic or manual setting, **MODE** (figure J.8.48);

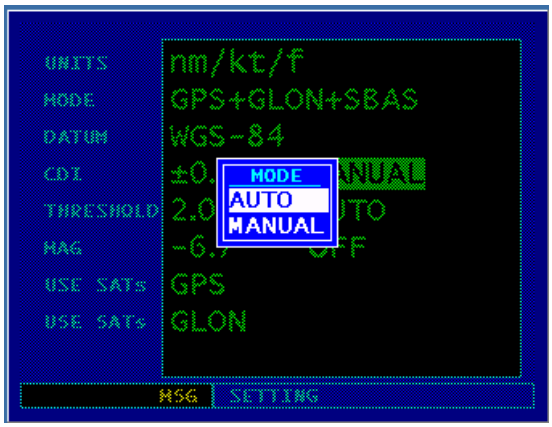


Figure J.8.48

c) set highlight to the sign **AUTO**;

d) press **ENT**. **CDI** field displays the sign and numerical value of automatic setting of CDI scale factor.

Setting of threshold of integrity signalling

To set limit of integrity signalling:

a) set highlight to numerical value of threshold of integrity signalling (field **THRESHOLD** figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays the pop-up window for threshold value selection of integrity signalling - **SELECT THRESHOLD** (figure J.8.49);

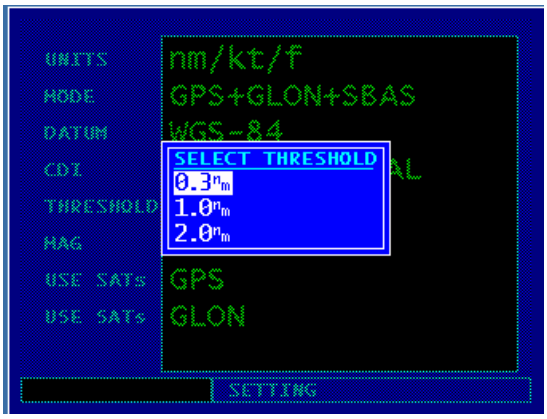


Figure J.8.49

c) set highlight to the field of display of required threshold of integrity signalling;

d) press **ENT** to confirm input of selected threshold of integrity signalling. The field **THRESHOLD** displays the sign of manual input of threshold of integrity signalling.

Activation of automatic setting of threshold of integrity signalling

To activate automatic setting of threshold of integrity signalling:

a) set highlight to the sign of automatic or manual setting of threshold of integrity signalling (field **THRESHOLD** figure J.8.41);

b) turn internal knob one position further. The window **SETTINGS** displays pop-up window of selection of automatic or manual setting, **MODE** (figure J.8.50);

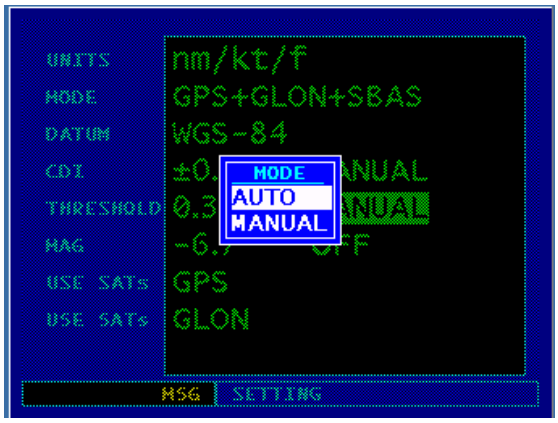


Figure J.8.50

c) set highlight to the sign **AUTO**;

d) press **ENT**. **THRESHOLD** field displays the sign и and numerical value of automatic setting of threshold of integrity signalling.

Activation/deactivation of magnetic declination

To activate/deactivate magnetic declination registration:

a) set highlight to the field of display of activation/deactivation of magnetic declination (field **MAG** figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays the pop-up window of activation/deactivation of magnetic declination registration **- SELECT** (figure J.8.51);

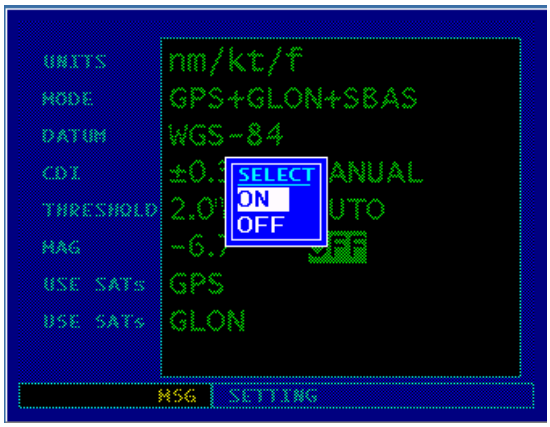


Figure J.8.51

c) set highlight to the field:

- **ON** - to activate magnetic declination registration;
- **OFF** - to deactivate magnetic declination registration;

d) press **ENT** to confirm or cancel magnetic declination registration.

Inclusion/exclusion of satellites GPS from calculation

To include/exclude satellites GPS from calculation:

a) set highlight to the field of inclusion/exclusion of satellites GPS from calculation (**USE SATs GPS** field, figure J.8.41);

b) turn internal knob one position further. **SETTING** window displays pop-up window of inclusion/exclusion of satellites GPS from calculation of **USE SATs GPS** (figure J.8.52);

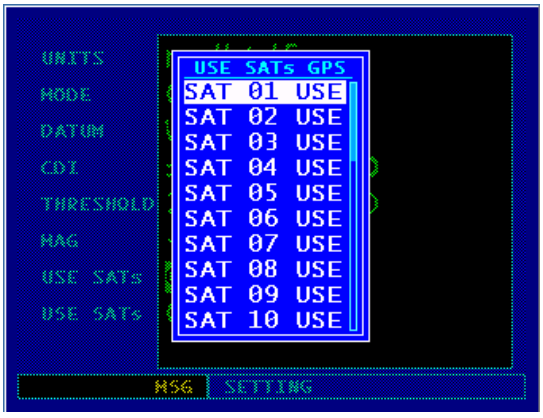


Figure J.8.52

c) set highlight to the field with number of satellite, which should be included/excluded from calculation . Turn internal knob one position further:

- **USE** – to include satellite in calculation,
- **OFF** – to exclude satellite from calculation;

d) press **ENT** to confirm inclusion/exclusion of satellites GPS from calculation.

Inclusion/exclusion of satellites GLONASS from calculation

To include/exclude satellites GLONASS from calculation:

a) set highlight to the field of inclusion/exclusion of satellites GLONASS from calculation (**USE SATs GLON** field, figure J.8.41);

b) turn internal knob one position further. **SETTINGS** window displays pop-up window of inclusion/exclusion of GLONASS satellites from calculation of **USE SATs GLON** (figure J.8.53);

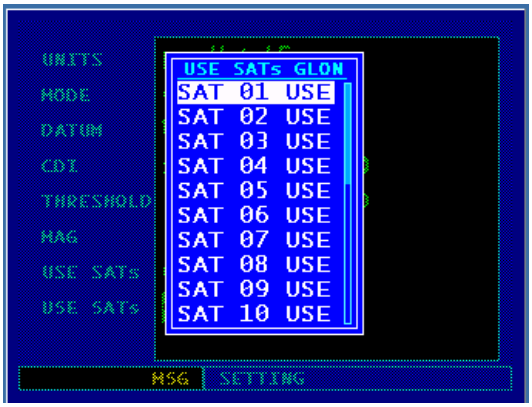


Figure J.8.53

c) set highlight to the field with number of satellite, which should be included/excluded from calculation . Turn internal knob one position further:

- **USE** - to include satellite in calculation,
- **OFF** - to exclude satellite from calculation;

d) press **ENT** to confirm inclusion/exclusion of satellites from calculation.

Language of messages

To select language of messages:

a) set highlight to the field of display of messages language (**LANGUAGE** field, figure J.8.41);

b) turn internal knob one position further. The window **SETTING** displays pop-up window of language selection of **SETTING LANGUAGE** messages (figure J.8.54);

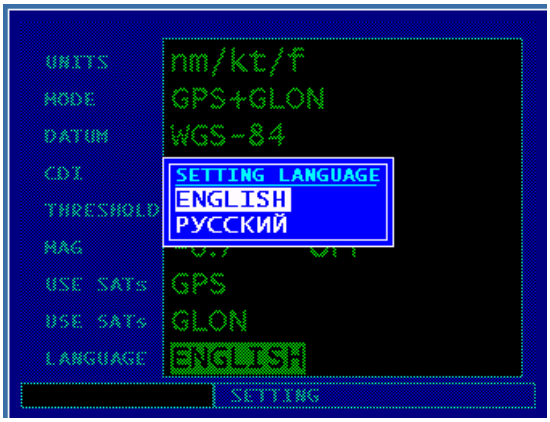


Figure 8.54

c) set highlight to the field of display of required message language;

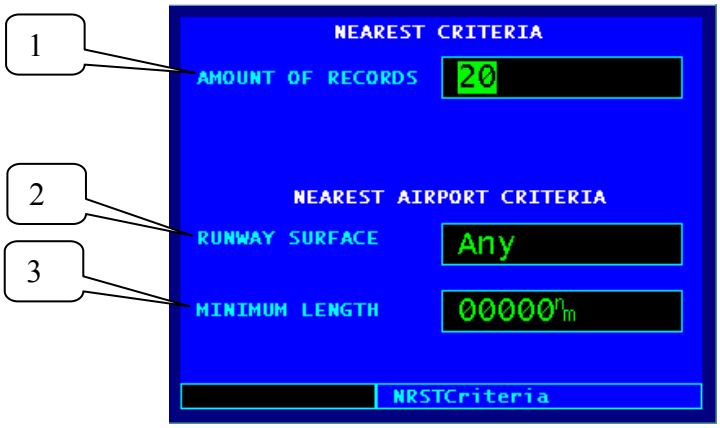
d) press **ENT** to confirm setting of a selected language of messages.

NEAREST CRITERIA field

NEAREST CRITERIA field is used to activate **NRSTCriteria** window, intended to set criteria of selection of nearest airports, displayed in **NRST** form.

To activate **NRSTCriteria** window**,** set highlight to **NEAREST CRITERIA** field (figure J.8.40) and press **ENT**. To return to **AUX3** page press **CLR** button.

View of **NEAREST CRITERIA** window is shown in figure J.8.55.



1 Setting of number of nearest navigation NP, displayed in the pages of the form **NRST**
2 Type of surface of the main RW of airports, displayed in the page **NRST1**
3 Minimum length of the main RW of airports, displayed in the page **NRST1**

Figure J.8.55

Setting of required number of nearest NP, displayed in the pages of NRST form

To set required number of nearest NP, displayed in the pages of **NRST** form:

a) set highlight to the field **AMOUNT OF RECORDS**;

b) set the required number of NP;

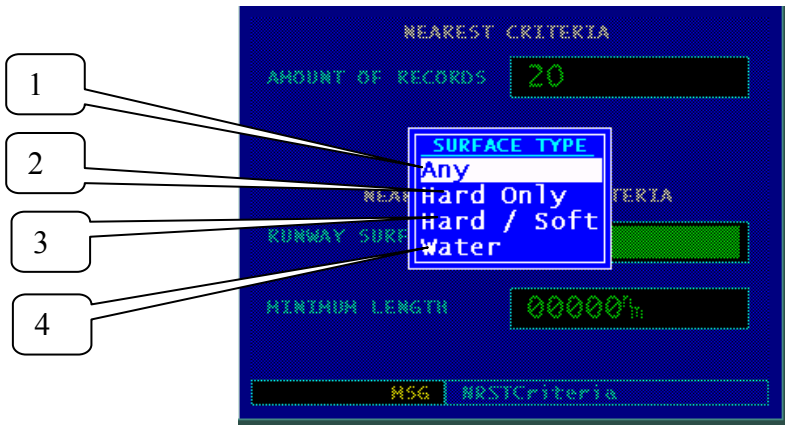
c) press **ENT** to confirm setting of required number of NP, displayed in the pages of **NRST** form.

Selection of type of RW surface of airports, displayed in NRST form

To select type of surface of the main RW of airports, displayed in the form **NRST**:

a) set highlight to **RUNWAY SURFACE** field (figure J.8.55);

b) turn internal knob one position further. **NRSTCriteria** window displays pop-up window of selection of type of surface of the main RW(figure J.8.56);



1 Any type of RW surface
2 Only hard surface of RW
3 Hard or soft surface of RW
4 Water

Figure J.8.56

c) set highlight to the field of required type of RW surface;

d) press **ENT** to confirm input of a selected type of RW.

Setting of minimum length of the main RW of airports, displayed in NRST form

To set minimum length of the main RW of airports, displayed in **NRST** form:

a) set highlight to **MINIMUM LENGTH** field**;**

b) set minimum length of RW;

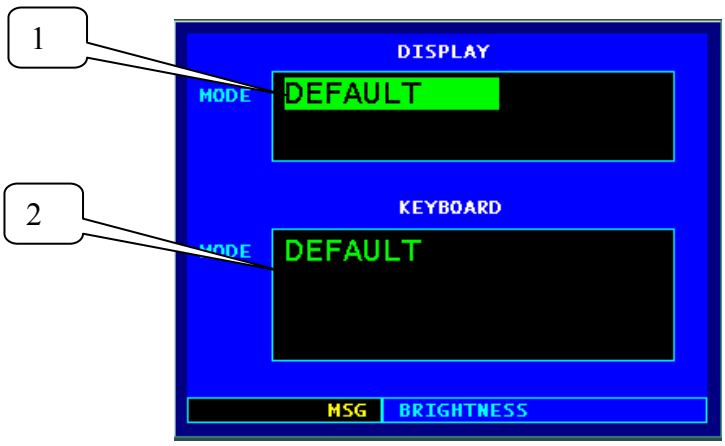
c) press **ENT** to confirm input of a selected minimum length of RW.

BRIGHTNESS field

BRIGHTNESS field is used to activate **BRIGHTNESS** window, intended to set highlight brightness of display and keyboard.

To activate **BRIGHTNESS** window**,** set highlight to **BRIGHTNESS** field (figure J.8.40) and press **ENT**. To return to **AUX3** page**,** press **CLR** button.

View of **BRIGHTNESS** window is shown in figure J.8.57.



1 Setting mode for highlight brightness of display
2 Setting mode for highlight brightness of keyboard

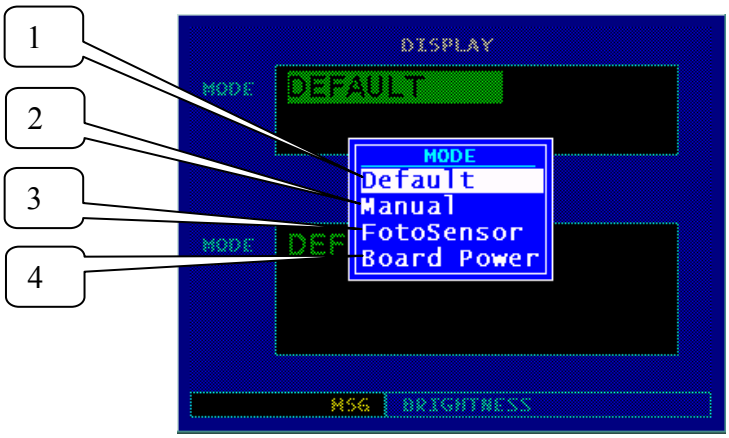
Figure J.8.57

Setting of highlight brightness of display

To set of highlight brightness of display:

a) set highlight to the field of setting mode for highlight brightness of display (figure J.8.57);

b) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of setting mode for highlight brightness of display **MODE** (figure J.8.58).



1 Factory setting of highlight brightness of display
2 Manual setting of highlight brightness of display
3 Setting of highlight brightness of display with the use of photo sensor
4 Setting of highlight brightness of display with the use of external voltage

Figure J.8.58

Factory setting of highlight brightness of display

For factory setting of highlight brightness of display:

a) set highlight to **Default** field (figure J.8.58);

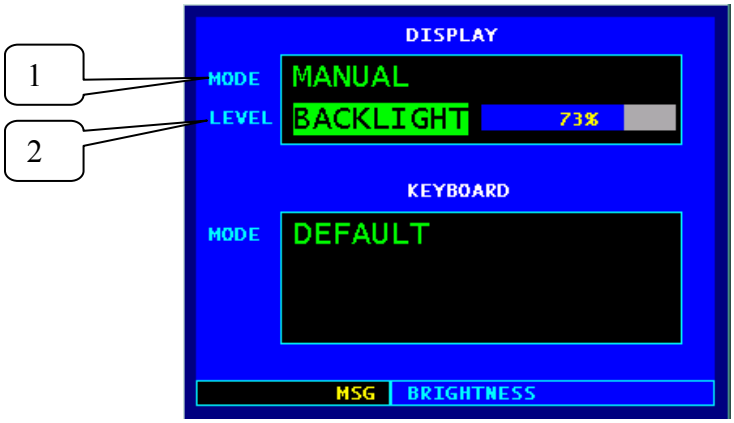
b) press **ENT** to confirm factory setting of highlight brightness of display.

Manual setting of highlight brightness of display

For manual setting of highlight brightness of display:

a) set highlight to the field **Manual** (figure J.8.58);

b) press **ENT**, RICU display shows information according to figure J.8.59;



1 Manual mode of setting of highlight brightness of display
2 Brightness level

Figure J.8.59

c) by rotating internal knob, set required brightness level of display light;

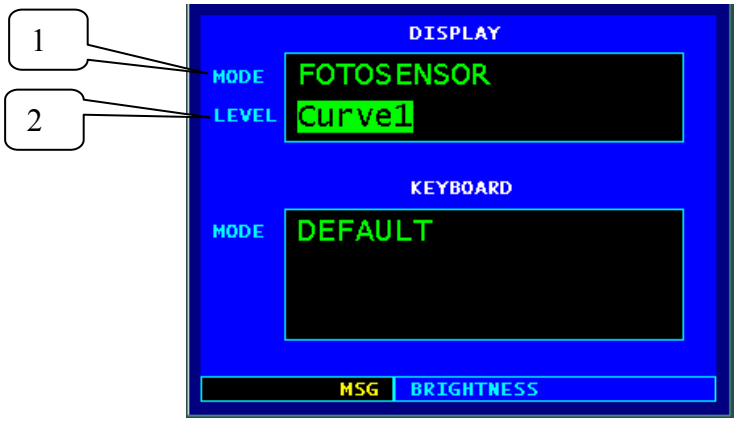
d) press **ENT** to confirm set brightness level of display light.

Setting of highlight brightness of display with the use of photosensor

To set highlight brightness of display with the use of photosensor:

a) set highlight to **FotoSensor** field(figure J.8.58);

b) press **ENT**, RICU display shows information according to figure J.8.60;



1 Setting of highlight brightness of display with the use of photosensor
2 Graphic chart of highlight brightness of display from photosensor illumination (see figure J.8.61)

Figure J.8.60

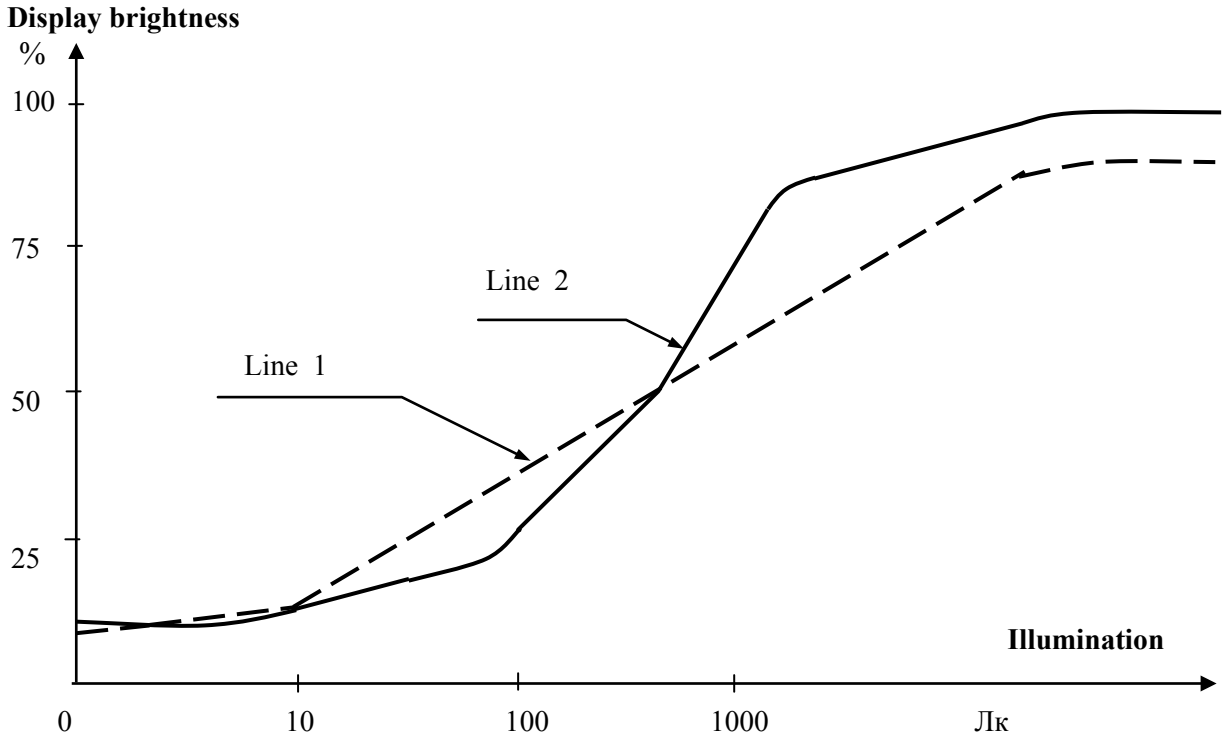


Figure J.8.61 - Graphic chart of highlight brightness of display from photosensor illumination

b) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of graphic chart of highlight brightness of display from photosensor illumination (figure J.8.62);

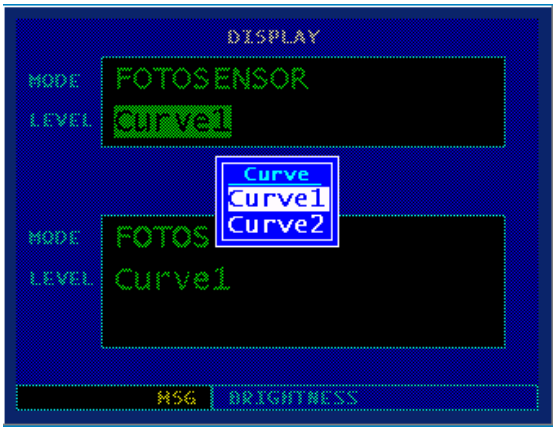


Figure J.8.62

d) set highlight to the field of required line;

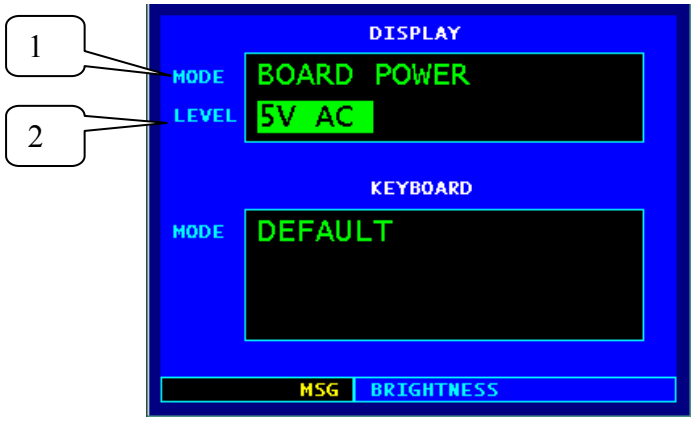
e) press **ENT** to confirm setting of highlight brightness of display with the use of photosensor in accordance with selected line.

Setting of highlight brightness of display with the use of external voltage

To set highlight brightness of display with the use of external voltage:

a) set highlight to **Board Power** field (figure J.8.58);

b) press **ENT**, RICU display shows information according to figure J.8.63;



1 Setting of highlight brightness of display with the use of external voltage
2 Type of control voltage

Figure J.8.63

c) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of type of control voltage (figure J.8.64);

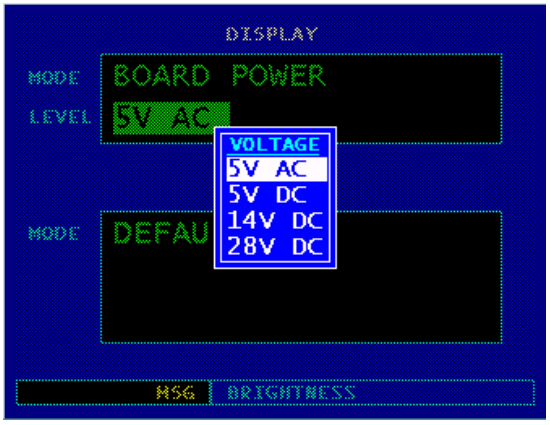


Figure J.8.64

d) set highlight to the field with required type of control voltage;

Note - *Type of control voltage is defined by scheme of equipment connection on a definite AC.*

e) press **ENT** to confirm a selected type of control voltage.

Setting of highlight brightness of keyboard

To set highlight brightness of keyboard:

a) set highlight to the field of setting mode of highlight brightness of keyboard (figure J.8.57);

b) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of setting mode of highlight brightness, **MODE** (figure J.8.58).

Factory setting of highlight brightness of keyboard

For factory setting of highlight brightness of keyboard:

a) set highlight to **Default** field (figure J.8.58);

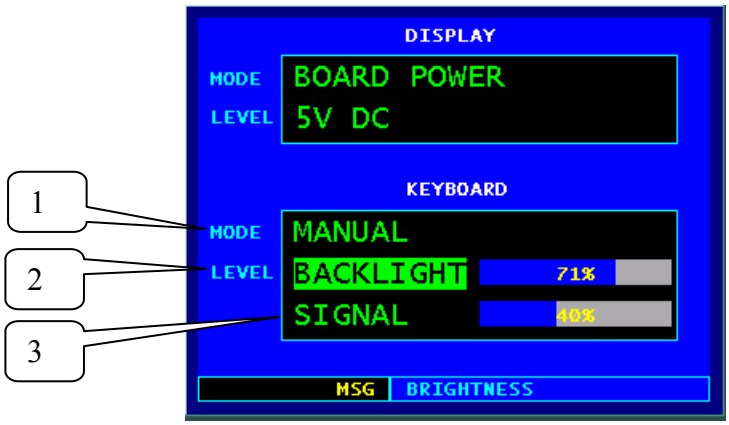
b) press **ENT** to confirm factory setting of highlight brightness of keyboard.

Manual setting of highlight brightness of keyboard

For manual setting of highlight brightness of keyboard:

a) set highlight to **Manual** field (figure J.8.58);

b) press **ENT**, **RICU** display shows information in accordance with figure J.8.65;



1 Manual setting of highlight brightness of keyboard
2 Background light
3 Signal light

Figure J.8.65

c) set highlight to **SIGNAL** field;

d) by rotating internal knob, set required brightness level of signal light;

e) set highlight to **BACKLIGHT** field;

f) by rotating internal knob, set required brightness level of background light;

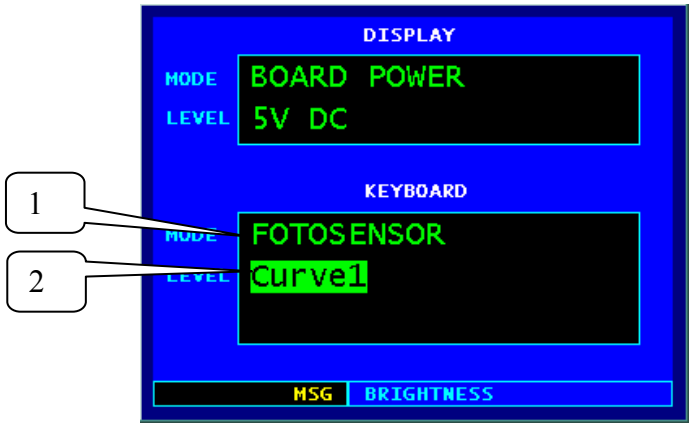
g) press **ENT** to confirm setting of brightness level of background and signal light.

Setting of brightness of keyboard with the use of photosensor

To set brightness of keyboard with the use of photosensor:

a) set highlight to **FotoSensor** field (figure J.8.58);

b) press **ENT**, **RICU** display shows information in accordance with figure J.8.66;



1 Setting of highlight brightness of keyboard with the use of photosensor
2 Graphic chart of highlight brightness of keyboard from photosensor illumination (figure J.8.67)

Figure J.8.66

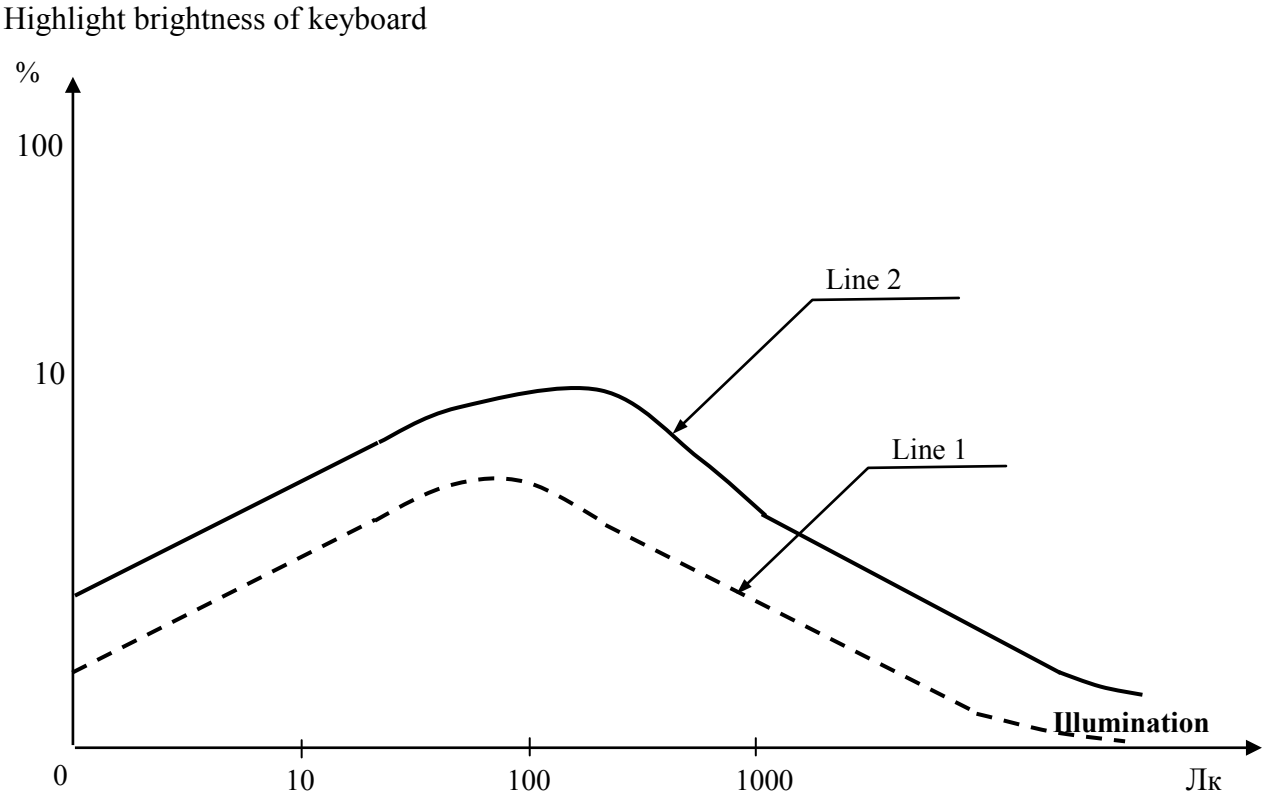


Figure J.8.67 - Graphic chart of highlight brightness of keyboard from photosensor illumination

c) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of graphic chart of brightness of keyboard from photosensor illumination (figure J.8.68);

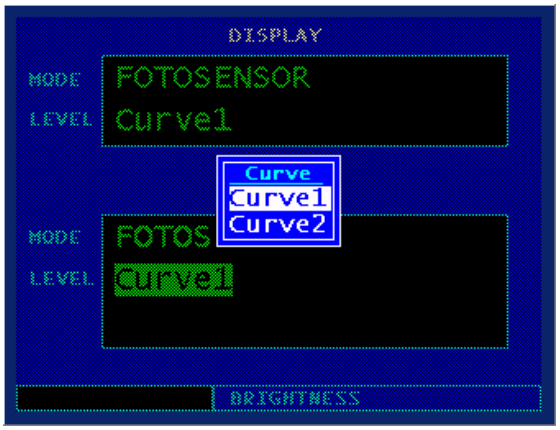


Figure J.8.68

d) set highlight to the field with required line;

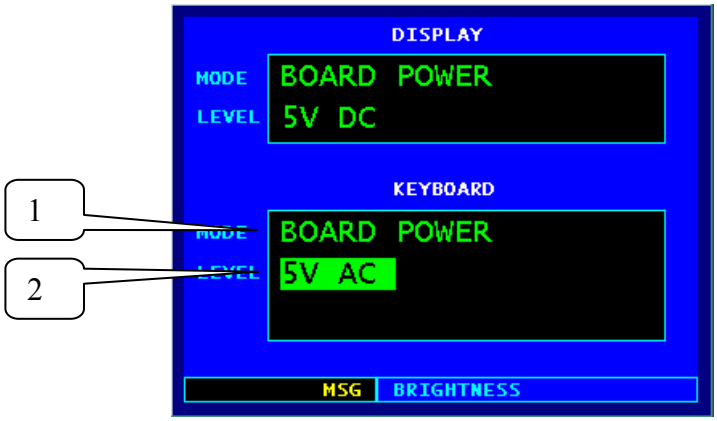
e) press **ENT** to confirm setting of highlight brightness of keyboard with the use of photosensor in accordance with selected line.

Setting of brightness of keyboard with the use of external voltage

To set highlight brightness of keyboard with the use of external voltage:

a) set highlight to **Board Power** line (figure J.8.58);

b) press **ENT**, **RICU** display shows information in accordance with figure J.8.69;



1 Setting of highlight brightness of keyboard with the use of external voltage
2 Type of control voltage

Figure J.8.69

c) turn internal knob one position further. **BRIGHTNESS** window displays pop-up window of selection of type of control voltage (figure J.8.70);

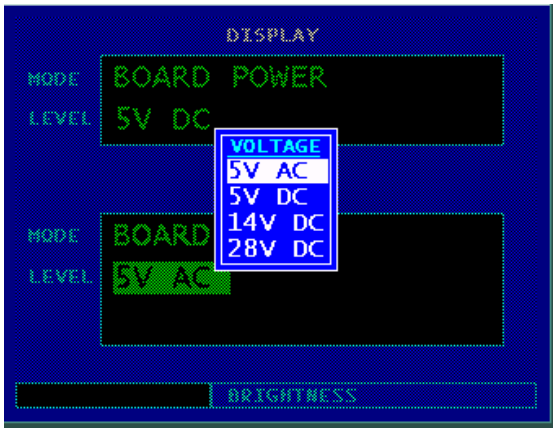


Figure J.8.70

d) set highlight to the field with required type of control voltage;

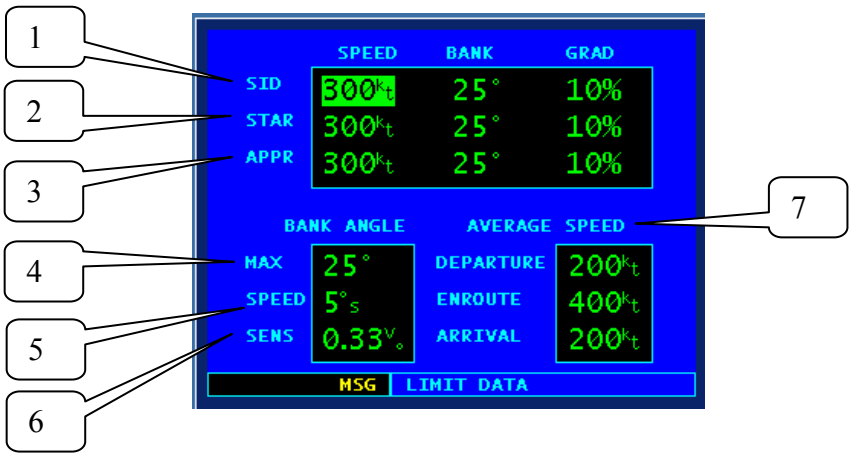
e) press **ENT** to confirm selected type of control voltage.

LIMIT DATA field

LIMIT DATA field is used to activate **LIMIT DATA** window, intended to set parameters of standard procedure calculation (**SID**, **STAR**, **APPROACH**) and to set limit values of angle of list.

To activate **LIMIT DATA** window**,** set highlight to the field **LIMIT DATA** (figure J.8.40) and press **ENT**. To return to **AUX3** page press **CLR** button.

View of **LIMIT DATA** window is shown in figure J.8.71.



1, 2, 3 Lines with parameters for **SID** (**STAR**, **APPROACH**) procedures calculation:
- aircraft average speed (**SPEED** field);
- maximum angle of list (**BANK** field);
- gradient of altitude change (**GRAD** field)

4 Maximum angle of list en route

5 Roll angle rate of rise

6 Slope of a signal "**Selected roll**"

7 Aircraft average speed (**AVERAGE SPEED**):
- **DEPARTURE** field - for terminal area of departure (30 miles);
- **ENROUTE** field - for averaged flight part;
- **ARRIVAL** field - for terminal area of arrival (30 miles)

Figure J.8.71

Input of parameters values for calculation of SID (STAR, APPROACH) procedures

To input parameters values for calculation of **SID** (**STAR**, **APPROACH**) procedures:

a) set highlight to the line of parameters for calculation of **SID** (**STAR**, **APPROACH**) procedures;

b) set the parameter required values for **SID** (**STAR**, **APPROACH**) procedures calculation:

- aircraft average speed (**SPEED** field);
- maximum angle of list (**BANK** field);
- gradient of altitude change (**GRAD** field);

c) press **ENT**.

Input of value "maximum roll angle"

Maximum roll angle limits the value "**Selected roll**" at all stages of the aircraft flight. To input the value "maximum roll angle":

a) set highlight to the field of maximum roll angle en route;

b) turn internal knob of the handle into one position. Herewith **LIMIT DATA** window will display **SET BANK MAX** pop-up window containing the list of possible values of maximum roll angle. Set highlight to the field of desired value of maximum roll angle;

Note *– The value of maximum roll angle en route should not exceed the value of maximum roll angle for aircraft type where the equipment is used.*

c) press **ENT**.

Rise rate input of roll angle

a) set highlight to the field of rise rate of roll angle;

b) turn internal knob of the handle into one position. Herewith **LIMIT DATA** window will display **SET BANK SPEED** pop-up window containing the list of possible values of rise rate of roll angle. Set highlight to the field of desired value of rise rate of roll angle;

c) press ENT.

Input of averaged speed in terminal areas of departure, arrival and en route

The input values of averaged speed in terminal areas of departure, arrival and en route shall be used for calculation of RAIM function for route forecast. To input averaged speed in terminal areas of takeoff, arrival and en route:

a) set highlight to the field of averaged speed in terminal area of takeoff;

b) set required value of speed;

в) press ENT.

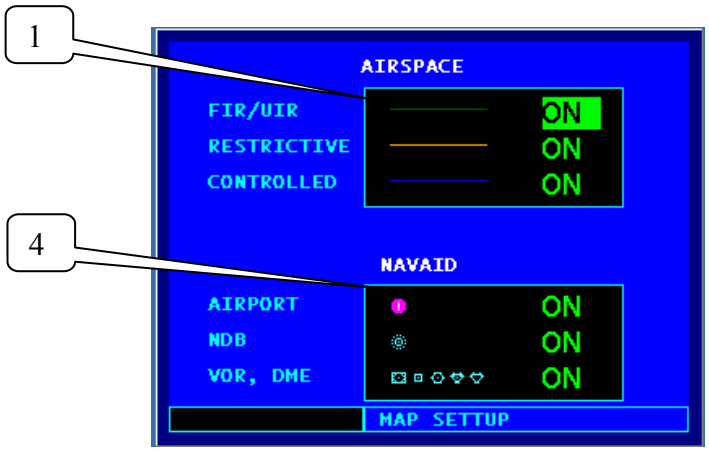
Input similarly required values of averaged speed in terminal area of arrival and en route.

MAP SETTUP field

MAP SETTUP field is used to activate **MAP SETTUP** window, intended to select air zones and reference designations of navigation references (airports, beacons), possible for detailed representation in **NAV1** and **NAV3** pages.

To activate **MAP SETTUP** window**,** set highlight to **MAP SETTUP** field (figure J.8.40) and press **ENT** button. To return to **AUX3** page press **CLR** button.

View of **MAP SETTUP** window is shown in figure J.8.72.



1 Field of activation/deactivation of possibility of detailed representation of air zones in **NAV1** and **NAV3** pages:
- of districts of **FIR**/**UIR** flight information;
- of air space of limited use;
- of controlled air spaces

2 Field of activation/deactivation of possibility of detailed representation of **NAV1** and **NAV3** of references designations of nearest navigation references:
- of airports;
- of **NDB** beacons;
- of **VOR**, **DME** beacons.

Figure 8.72

Selection of air zones and reference designations of navigation reference, possible for detailed representation in NAV1 and NAV3 pages

To select air zones and reference designations of navigation references, possible for detailed representation in **NAV1** and **NAV3** pages:

a) set highlight to the field of activation/deactivation of detailed representation of air zone or reference designation of navigation reference, detailed representation of which it is possible to activate/deactivate in **NAV1** and **NAV3** pages;

b) turn internal knob one position further. The window **MAP SETTUP** displays **SELECT** pop-up window (figure J.8.73);

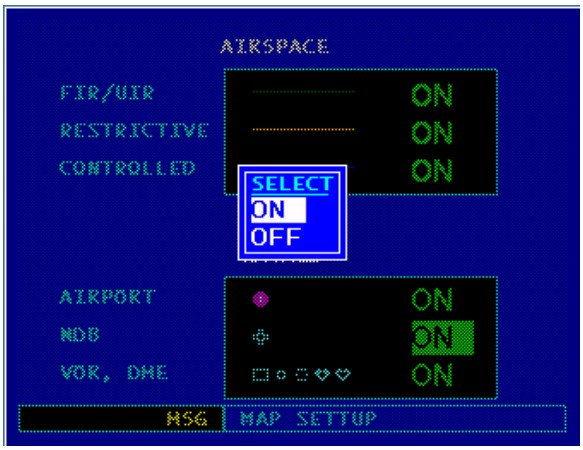


Figure J.8.73

c) set highlight in **SELECT** pop-up window to the field:

- **ON** – to activate possibility of detailed representation;
- **OFF** – to deactivate;

d) press ENT. Possibility of detailed representation of selected types of air zones and reference designations of nearest navigation references will be activated/deactivated in **NAV1** and **NAV3** pages.

COPY USER DB field

COPY USER DB field is used to activate **SEND USER DB** window, intended to copy user database (of user NP, flight plans) to other RICU.

To activate **SEND USER DB** window**,** set highlight to the field **COPY USER DB TO BPIU2** (figure J.8.40) and press **ENT**. To return to **AUX3** page**,** press **CLR** button.

View of **SEND USER DB** window is shown in figure J.8.74.

1 Field of setting of copying of user database to other RICU

Figure J.8.74

Copying of user database to other RICU

When operating two sets of equipment it is necessary that databases were identical. If two sets of equipment are installed in AC, after switching-on, identity of user databases is automatically checked. If databases are different than RICU display automatically shows message saying that databases are different. In this case it is necessary to copy user data base with one RICU to another. User database copying is recommended to make during preflight preparation.

To copy user database to other RICU:

а) set highlight to the field of setting of copying of user database to other RICU;

б) input **ОК** value. Copying of user database to other RICU takes place. Display of transmitting RICU shows **SEND USER DB** window, in which volume of transmitted information is stated in percents (figure J.8.75). Display of receiving RICU shows the

RECEIVE USER DB window, in which volume of received information is stated in percents (figure J.8.76);

Note – *If user database copying was stopped for more than 2 minutes (transmitted and received information volume shown in fig. J.8.75, J.8.76 is not changed) both RICU should be turned off, then turned on and copying should be repeated.*

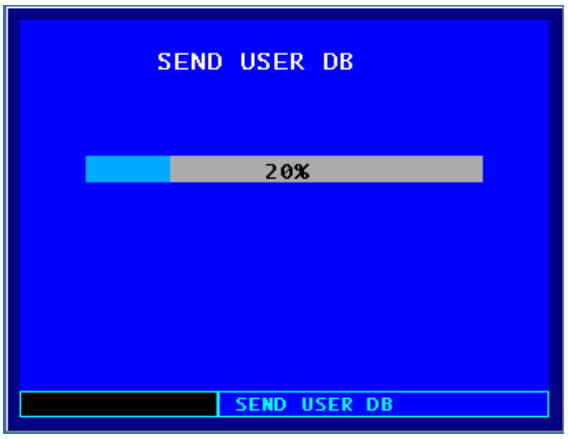


Figure J.8.75

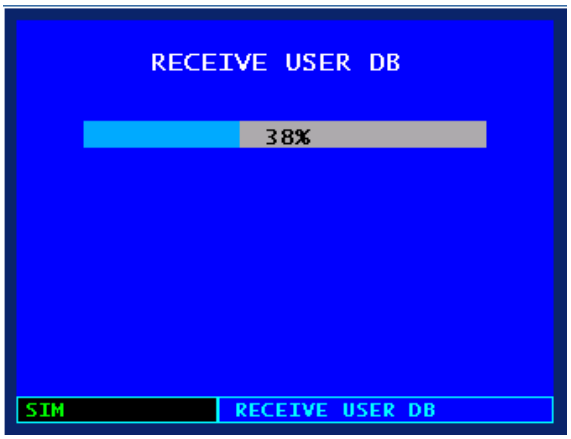


Figure J.8.76

c) after copying of user database to other RICU, display of transmitting RICU displays **SEND USER DB** window in accordance with figure J.8.77. Display of receiving RICU shows **RECEIVE USER DB** window in accordance with figure J.8.78;

Figure J.8.77

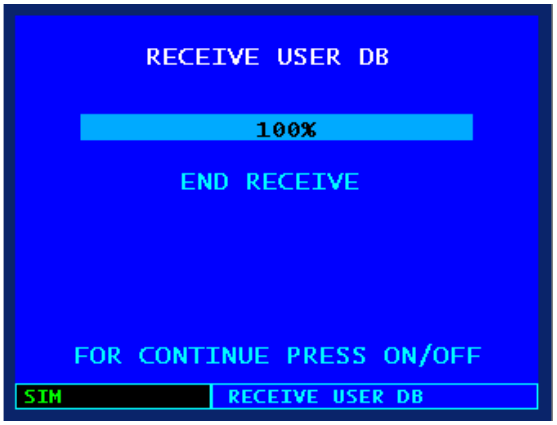
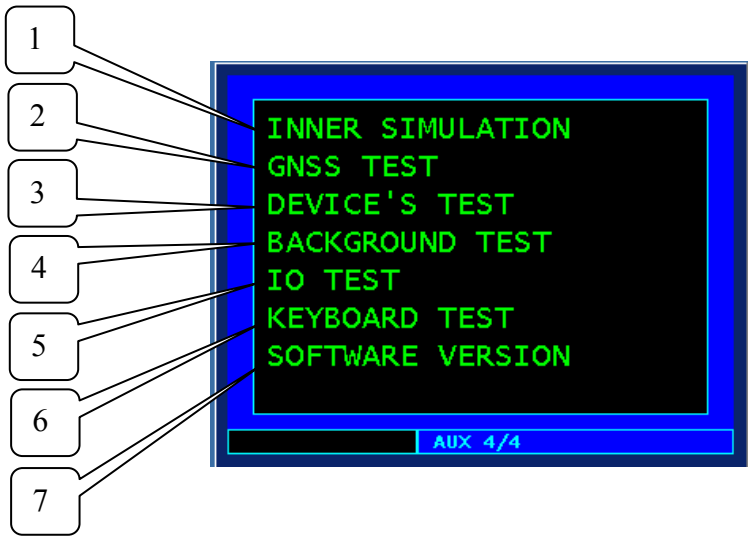


Figure J.8.78

d) to continue operation of receiving RICU, switch off and then switch on receiving RICU.

AUX4 page

View ofh **AUX4** page is shown in figure J.8.79.



1 Activation of built-in flight simulator
2 Activation of GNSS test, GNSS receiver restart with RAM clearance
3 Availability (unavailability) of communication with external devices
4 Background testing
5 External devices test
6 Keyboard test
7 Software versions

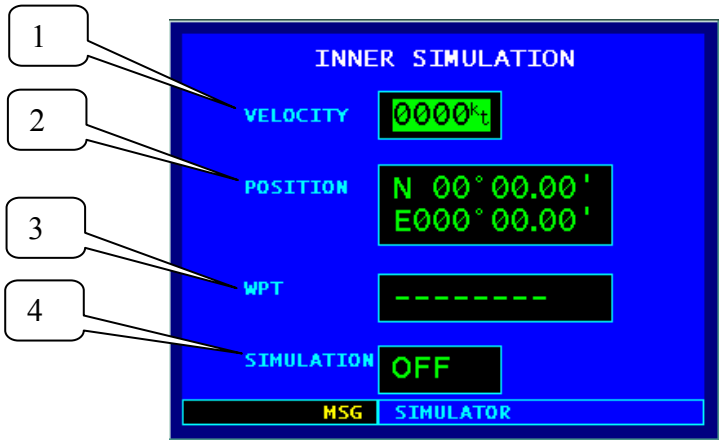
Figure J.8.79

INNER SIMULATION field

INNER SIMULATION field is used to activate **SIMULATOR** window, intended to activate built-in simulator.

To activate **SIMULATOR** window**,** set highlight to **INNER SIMULATION** field (figure J.8.79) and press **ENT**. To return to **AUX4** page**,** press **CLR** button.

View of **SIMULATOR** window is shown in figure J.8.80.



1 Speed
2 Coordinates of initial WP
3 Identifier of initial WP
4 Activation/deactivation of built-in simulator

Figure J.8.80

Setting of speed

To set a speed:

a) set highlight to display field of speed;

b) set required speed;

c) press ENT.

Setting of coordinates of initial WP

It is possible to set coordinates of initial WP either by setting coordinates in the field of coordinates setting or by setting identifier in **WP** field.

*To set coordinates in the **POSITION** field*:

a) set highlight to display field of coordinates;

b) set initial coordinates.

*To set identifier in **WP** field:*

a) set highlight to **WP** field;

b) turn internal knob one position further. RICU display shows the **WPT1** page;

c) input identifier of required WP. Press ENT. Highlight will move to the field **DONE?**;

d) press **ENT**. RICU display shows **SIMULATOR** window, in which coordinates of selected WP are displayed as initial coordinates.

Activation/deactivation of built-in simulator

To activate/deactivate built-in simulator:

a) set highlight to **SIMULATION** field;

b) turn internal knob one position further. **SIMULATOR** window displays a pop-up window of built-in simulator activation/deactivation;

c) set highlight to the field:

- **ON** – to activate a built-in simulator;
- **OFF** - to deactivate a built-in simulator;

d) press ENT.

GNSS TEST field

GNSS TEST field serves for fetching **GNSS TEST** pop-up window, meant for starting enhanced test of GNSS receiver and restarting GNSS receiver with memory clearing.

To switch on the test of receiver GNSS:

a) set highlight to **GNSS TEST** field (figure J.8.79);

b) press **ENT**, the page **AUX4** displays **GNSS TEST** pop-up window (figure J.8.81);

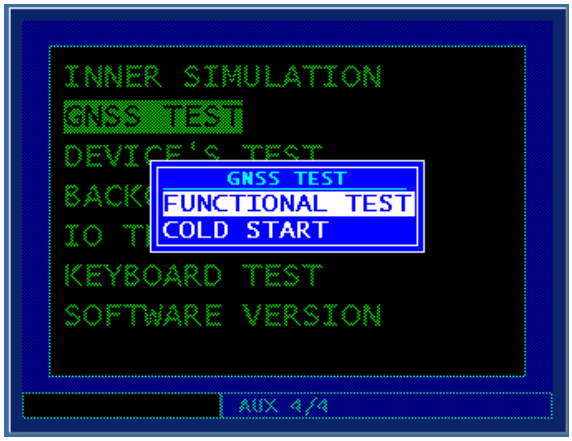


Figure J.8.81

c) set highlight to **FUNCTIONAL TEST** field to activate GNSS receiver test;

d) press ENT to confirm selected function. Pop-up window will stop being displayed. Result of testing of receiver GNSS is displayed in **FonTest 1** window (**AUX4/BACKGROUND TEST/ENT)**.

For activation of GNSS receiver restart with RAM clearance:

a) set highlight in **GNSS TEST** field (Fig. J.8.79);

b) press **ENT**, **AUX4** page shall indicate **GNSS TEST** popup window (Fig. J.8.81);

c) set highlight in **COLD START** field;

d) press **ENT** to restart GNSS receiver with RAM clearance.

WARNING AFTER RESET OF RECEIVER GNSS WITH RAM CLEANING IT IS NECESSARY TO SWITCH OFF AND THEN SWITCH ON RICU.

DEVICE'S TEST field

DEVICE'S TEST field is used for **DEVICE'S TEST** window call, which is purposed for review of the information concerning availability (unavailability) of connection with external devices.

To call **DEVICE'S TEST** window set highlight in **DEVICE'S TEST** field (Fig. J.8.79) and press **ENT**. To return on **AUX4** page press **CLR**.

View of **DEVICE'S TEST** window is given on Fig. J.8.82.

1 Devices:
- antenna;
- DME device;
- VOR device;
- SVS sensors;
- IRS sensors

2 Availability (**YES**)/unavailability (**NO**) of communication with the device

Figure J.8.82

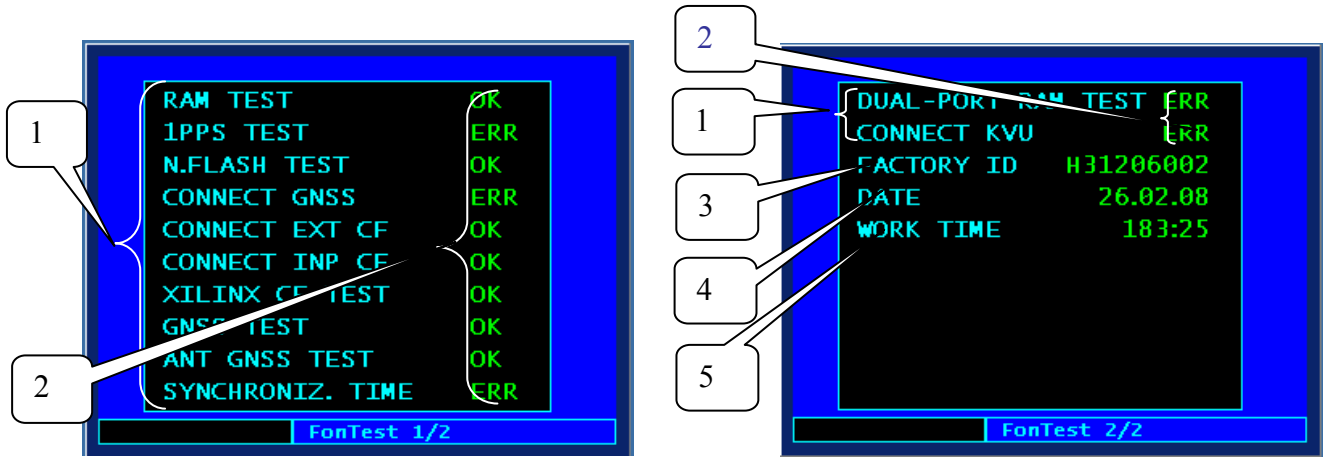
BACKGROUND TEST field

BACKGROUND TEST field is used to **FonTest1** and **FonTest2** open windows with the results of background testing.

To activate **FonTest1** window**,** set highlight to **BACKGROUND TEST** field (figure J.8.79) and press **ENT**. To display second window of background testing results **FonTest2,** turn internal knob one position further.

To return to **AUX4** page press **CLR** button.

View of **FonTest1** and **FonTest2** windows is shown in figure J.8.83.



1 Functional assemblies of equipment
2 Result of background testing:
- **OK** – functional assembly is correct;
- **ERR** - functional assembly is erroneous;
- **WAIT** – sign of testing accomplishment

3 Serial number of equipment
4 Production date of equipment
5 Operating time of equipment (hours, minutes)

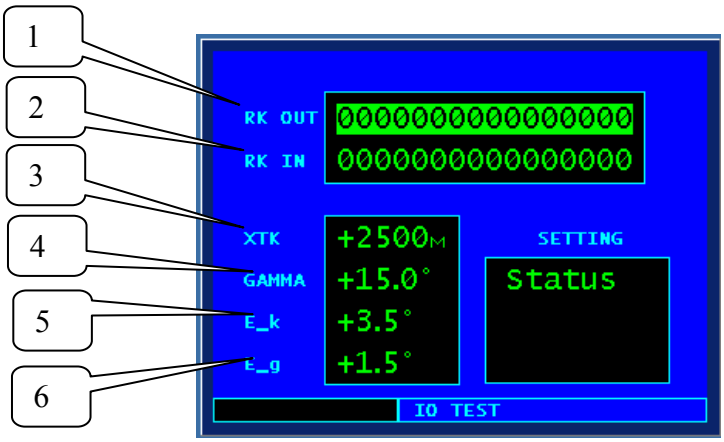
Figure J.8.83

In case of normal background testing, **OK** must be displayed in the fields of display of testing results in **FonTest1** and **FonTest2** windows. Appearance of **ERR** signals about failure of a definite functional assembly of equipment.

IO TEST field

TEST IO field is used to activate **IO TEST** window, intended to test external devices. To activate the window **IO TEST,** set highlight to **IO TEST** field (figure J.8.79) and press **ENT**. To return to **AUX4** page**,** press **CLR** button.

View of **IO TEST** window is shown in figure J.8.84.



1 Output one-time order
2 Input one-time order
3 Deviation from DT
4 Selected roll
5 Deviation from course
6 Deviation from glide path
Note - ***SETTING*** *window is not used, it is reserved for further application*

Figure J.8.84

Check of output one-time orders

To check output one-time orders:

a) set highlight to **RK OUT** field;

b) activate output of one-time orders in **RK OUT** field. Activation of one-time order (see 034.50.00 Appendix A, «**X2**» connector of RICU) is accomplished by setting «**1**» symbol in respective decade of **RK_OUT** field. Rightmost symbol corresponds to one-time order **RK0_OUT**, leftmost symbol corresponds to one-time order **RK15_OUT**;

c) check availability of output of one-time order to external devices in accordance with set one-time orders in **RK OUT** field.

Check of input one-time orders

Check availability of one-time orders received from respective external devices. (see 034.50.00 Appendix A, connector «**X4**» RICU). Availability of symbol «**1**» in decades of the line **RK IN** means availability of one-time order. Rightmost symbol of the field **RK IN** corresponds to one-time order **IN_L_1**, the eighth symbol from the right corresponds to one-time order **IN_L_8**, the ninth symbol from the right corresponds to one-time order **IN_N_1**, leftmost symbol corresponds to one-time order **IN_N_8**.

Check of formation of signal of deviation from DT

To check formation of signal of deviation from DT:

a) set highlight to **XTK** field;

b) set value of deviation from DT;

c) check on HSI deviation of arrow on lateral deviation scale to the value corresponding to the value set in **XTK** field .

Check of formation of «Selected roll» signal

To check formation of «**Selected roll**» signal*:*

a) set highlight to **GAMMA** field;

b) set value of «**Selected roll**» signal;

c) press ENT;

d) check direct voltage on external device, connected to RICU through «**Selected roll**» circuit. The voltage must correspond to set value of «**Selected roll**» signal in **GAMMA** field from the calculation of 0,33 V for 1 degree.

The check of formation of deviation signal from course

To check formation of deviation signal from course:

a) set highlight to **E_k**; field;

b) set value of deviation signal from course;

c) press ENT;

d) check direct voltage on external device, connected to RICU through the circuit of deviation from course. Voltage must correspond to set value of the signal of deviation from course in **E_k** field from the calculation of 15 мV for 1 degree.

Check of formation of deviation signal from glide path

To check formation of signal of deviation from glide path:

a) set highlight to **E_g** field;

b) set value of deviation signal from glide path;

c) press ENT;

d) check direct voltage on external device, connected to RICU through the circuit of deviation from glide path. The voltage must correspond to set value of the signal of deviation from glide path in the field **E_g** from the calculation 15 мV for 1 degree.

KEYBOARD TEST field

KEYBOARD TEST field is used to activate **Keyboard Test** window, intended to accomplish keyboard test.

To activate the window **Keyboard Test,** set highlight to **KEYBOARD TEST** field (figure J.8.79) and press **ENT** button. To return to **AUX4** page**,** press **CRSR** button, and then **ENT**.

View of **Keyboard Test** window is shown in figure J.8.85.

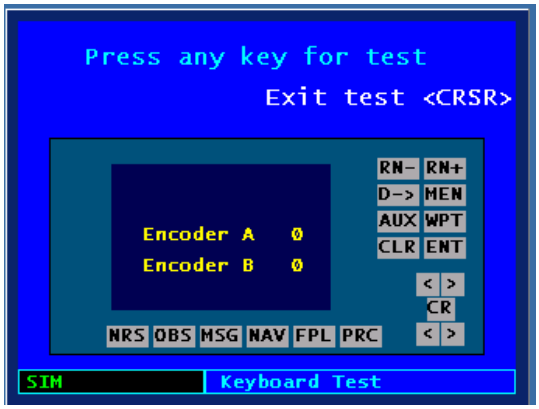


Figure J.8.85

Accomplish check of keyboard by pressing buttons of RICU keyboard in turn. When pressing the button, the field corresponding to pressed button will be highlighted on RICU display.

Check external knob, by rotating it clockwise (counter-clockwise). In the field of **Encoder A** parameter RICU display shows values from 0 to 63 (from 63 to 0) in turn, starting from the value, which was displayed before rotating. When rotating external knob, the field of «>» («<») symbol over **CR** field will be highlighted on RICU display.

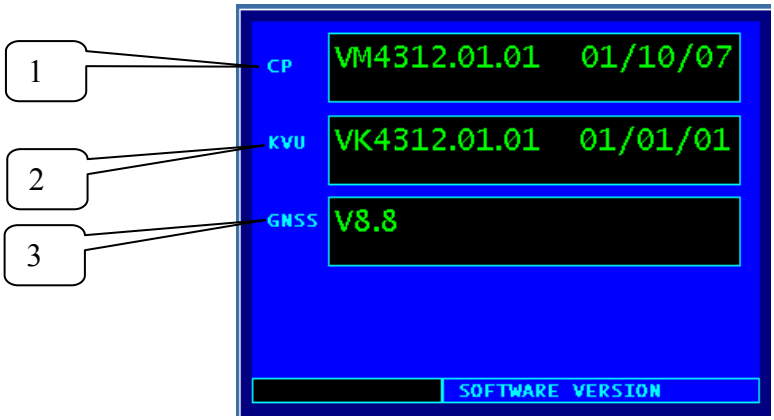
Accomplish check of internal knob. Check is accomplished by analogy with external knob check.

SOFTWARE VERSION field

SOFTWARE VERSION field is used to activate the window **SOFTWARE VERSION** window, intended to control software versions.

To activate the **SOFTWARE VERSION** window**,** set highlight to **SOFTWARE VERSION** field (figure J.8.79) and press **ENT** button. To return to **AUX4** page**,** press **CLR** button.

View of **SOFTWARE VERSION** window is shown in figure J.8.86.



1 Version of SW of RICU central calculator
2 Version of SW of peripheral control unit
2 Version of SW of GNSS receiver

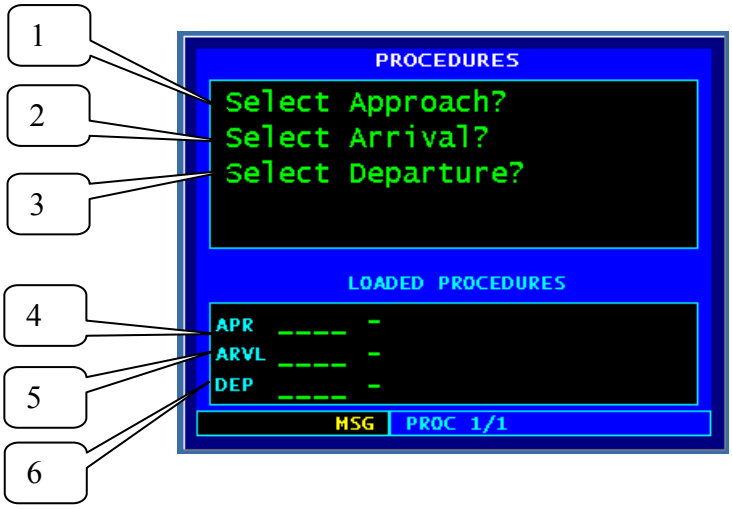
Figure J.8.86

J.9 Operation description in PROC form

The **PROC** form is used to select and involve **APPROACH**, **ARRIVAL**, **DEPARTURE** standard procedures in a flight plan.

Entry in **PROC** form is accomplished by pressing **PROC** button on the front panel of RICU. By repeated pressing **PROC** button**,** RICU display shows the form, which was displayed on RICU prior to activation of **PROC** form.

View of **PROC** form is shown in figure J.9.1.



1 Selection of standard procedure of approach (**APPROACH)**
2 Selection of standard procedure of arrival (**ARRIVAL)**
3 Selection of standard procedure of departure (**DEPARTURE)**
4 Information about selected **APPROACH** procedure
5 Information about selected **ARRIVAL** procedure
6 Information about selected **DEPARTURE** procedure

Figure J.9.1

Selection of standard procedure of approach (APPROACH)

Selection of standard procedure of approach (**APPROACH)** is accomplished by analogy with given one in description of **FPL1** page. After selection of **APPROACH** procedure information about selected procedure (name of transit point and name of **APPROACH** procedure) is displayed in **APR** field, procedure is involved in active flight plan and RICU displays the page of active flight plan of **FPJ** form.

Selection of standard procedure of arrival (ARRIVAL)

Selection of standard procedure of arrival **ARRIVAL** is accomplished by analogy with given one in description of **FPL1** page. After selection of **ARRIVAL** procedure**,** information about selected procedure(name of transit point and name of **ARRIVAL** procedure, name of RW) is displayed in **ARVL** field, procedure is involved in active flight plan and RICU displays the page of active flight plan of **FPJ** form**.**

Selection of standard procedure of departure (DEPARTURE)

Selection of **DEPARTURE** standard procedure is accomplished by analogy with given one in description of **FPL1** page. After selection of **DEPARTURE** procedure**,** information about selected procedure: name of transit point, name of **DEPARTURE** procedure**,** name of RW is displayed in **DEP** field**,** procedure is involved in active flight plan and RICU displays the page of active flight plan of **FPJ** form**.**

J.10 Messages generated by equipment

Messages generated by equipment, can be:

a) informative:

- which are displayed after pressing **MSG** button;
- which are displayed automatically;

b) warning.

Messages can be generated by equipment in Russian and English. Fulfil language setting when setting system parameters on **AUX3** page.

After eliminating the reason, causing message generation, the message will stop being displayed.

Informative messages

When informative message appears, signal light of **MSG** button is activated. When pressing **MSG** button RICU display shows informative message. View of the window of informative message is shown in figure J.10.1.

1 Field of message display

Figure J.10.1

If there are several informative messages, thus signal light of **MSG** button remains activated until all the messages are read. After reading all messages and pressing **MSG** button, RICU display shows the form, which was on RICU display prior to appearance of message window.

List of informative messages, which are displayed after pressing **MSG** blinking button is shown in table J.10.1. List of informative messages, which are displayed automatically, is shown in table J.10.2.

Table J.10.1

Messages in English	Messages in Russian	Note
Aircraft is found outside legal bounds	**Самолет вышел за границы установленного коридора**	
Integrity threshold has been exceeded	**Превышен порог целостности**	
Non-precision computing	**Режим счисления с пониженной точностью**	Non-precision computing is activated
RAIM is not available	**RAIM не подтвержден**	Message about non-possibility to accomplish RAIM function, it is necessary to transfer to alternative navigation
Scale CDI does not correspond to a mode	**Шкала CDI не соответствует режиму**	
Threshold does not correspond to a mode	**Порог целостности не соответствует режиму**	
Select true angle mode	**Выбери режим истинных углов**	
Coordinates aren't accessible	**Координаты отсутствуют**	Message appears when current coordinates are absent or their accuracy more than 5 miles.
Degradation accuracy to RNP20	**Ухудшение точности до RNP20**	
Enter coordinates time and date	**Введите координаты время и дату**	
Enter_wind_speed	**Введите скорость ветра**	

Table J.10.2

Messages in English	Messages in Russian	Note
DATABASE EXPIRED	**Срок действия НБД закончился**	
DATABASE MISSING	**НБД отсутствует**	
Cannot activate OFFSET	**Не могу активировать OFFSET**	
Active FPL is absent	**Активный маршрут отсутствует**	Message is displayed if attemping to switch on the mode of movement on a parallel fligt plan when a flight plan is not activated
Link with GNSS is bad	**Отсутствует связь с модулем GNSS**	
Link with KVU is bad	**Отсутствует связь с модулем КВУ**	
Antenna is bad	**Отказ антенны**	
Receiver's testing is failure	**Отказ каналов приемника**	
The NDB with CROSS-RICU differ	**НДБ с другим БПИУ различны**	
The data with CROSS-RICU differ	**Данные с другим БПИУ различны**	
Route off Integrity threshold has been exceeded	**Маршрут деактивирован Превышен порог целестности**	
SYSTEM ERROR n	**Системная ошибка n**	Program error during acccomplishment, where n - code of error: 1 – access to non-existing memory; 2 – error of selection of commands/data from memory; 3 – program interruption; 4 – invalid command. Data of error can be followed by additional text information

Warning messages

Warning messages are automatically displayed in the right part of status line of the form.

List of warning messages is shown in table J.10.3.

Table J.10.3

Messages in English	Messages in Russian	Note
Arriv at UKKB in 120s	**Приб в UKKB через 120 с**	Arrival to WP with name UKKB in 120 seconds (message is displayed when following the flight plan)
Turn to 123° within 15s	**Курс 123° через 15 с**	Time left to start of course change procedure (transfer to next way leg), 15 s